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ProTego

DATA-PROTECTION TOOLKIT REDUCING RISKS IN HOSPITALS AND CARE CENTERS

Project Nº 826284

ProTego

D8.3 Report on the 1st period dissemination and communication activities and results

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Executive summary

This deliverable provides an overview of the dissemination and communication activities that were carried out by the consortium members of the ProTego project during the first project year. These activities range from publishing news items and general project information on the project website, to publishing monthly blogs or active participation in important industrial conferences or workshops. The most relevant dissemination and communication activities of ProTego in 2019 are the following: (1) project website, (2) press releases, articles and social media posts, (3) brochures and posters, (4) participation in industry-oriented events and conferences, (5) participation in community building activities, (6) participation in workshops, and (7) university education. For each of the categories, the specific actions and results will be presented.

We want to highlight two particular dissemination results. First of all, the consortium partners committed themselves to publish each month at least one blog post – related to ProTego – on the public project website. Besides being an interesting dissemination means, all statistics show that these blog posts clearly help in increasing the number of visitors to the website and the general awareness of the ProTego project. Second, ProTego consortium partners actively participated in the Strata Data Conference – the largest data conference series in the world – and the FHIR DevDays conference. These are relevant communities for the ProTego project. Moreover, the participation at the FHIR DevDays also accomplished to establish a working relationship with the HL7 FHIR community and to define the initial steps of contributing to the FHIR specification based on the work of ProTego.

Contributors Table

DOCUMENT SECTION	AUTHOR(S)	REVIEWER(S)
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Table of Acronyms and Definitions

Acronym	Definition
FHIR	Fast Healthcare Interoperability Resources
GDPR	General Data Protection Regulation
HL7	Health Level Seven
IoMT	Internet of Medical Things
IoT	Internet of Things
OSR	Ospedale San Raffaele
R&D	Research and Development
WP	Work Package

I. Introduction

Communication and dissemination of the projects activities and results are important measures to create impact. Therefore, the project consortium has prepared a dissemination plan and corresponding communication tools (see deliverable D8.1) to fully support these activities. The dissemination actions of the project are mainly focused around scientific fields related to cybersecurity in the health sector and IT systems. To monitor the status and progress, the dissemination activities of all project partners are tracked and continuously structured. This includes internal templates to gather all contributions of the project partners, reminders and progress reports to raise the awareness of dissemination and to provide an overview of achieved results.

Within this deliverable, an overview will be given of the current status of all dissemination and communication activities from the start of the project until the beginning of December 2019 (i.e. more or less the first project year), based on these internal templates. Where necessary, some extra context will be given. A similar overview will be published after the second and third year of the project, respectively in deliverable D8.5 and D8.7.

The rest of this deliverable is structured according to the specific dissemination and communication activity. These are respectively:

- Project website
- Press releases, articles and social media posts
- Brochures and posters
- Industry events and exhibitions
- Community building activities
- Workshops
- University education

II. Dissemination Activities

II.1. Website

The main dissemination and communication tool of the ProTego project is the project website. This is obviously not the sole environment to provide information about the project results and activities to relevant stakeholders (see rest of this deliverable). Nevertheless, the project website is regularly updated and maintained to provide as much up-to-date information about the project to all target stakeholders, and is most likely for many stakeholders the most important source of information about the ProTego project.

The ProTego website is available on the following link:

https://protego-project.eu/

Besides general information about ProTego, visitors can visit the following subcategories: Publications & Deliverables, News, Monthly Blog, Calendar, Links, and Restricted Area. All subcategories are open to the general public, except the latter. More information about the design of the website can be found in Deliverable D8.1.

Below, we will give an overview of some statistics related to the ProTego project website.

II.1.1. Statistics

To monitor the website statistics and support the reporting, we have enabled Google Analytics in the ProTego project website. The statistics disccused below are all derived from the available dashboards.

II.1.1.a. Total number of visitors

The first statistic that we monitored, is the total number of visitors of the ProTego website. Figure 1 shows some general statistics related to the ProTego website, including the number of new users and the number of page views. Since the project website was only launched in the beginning of this year, Google obviously considers all users as new users.

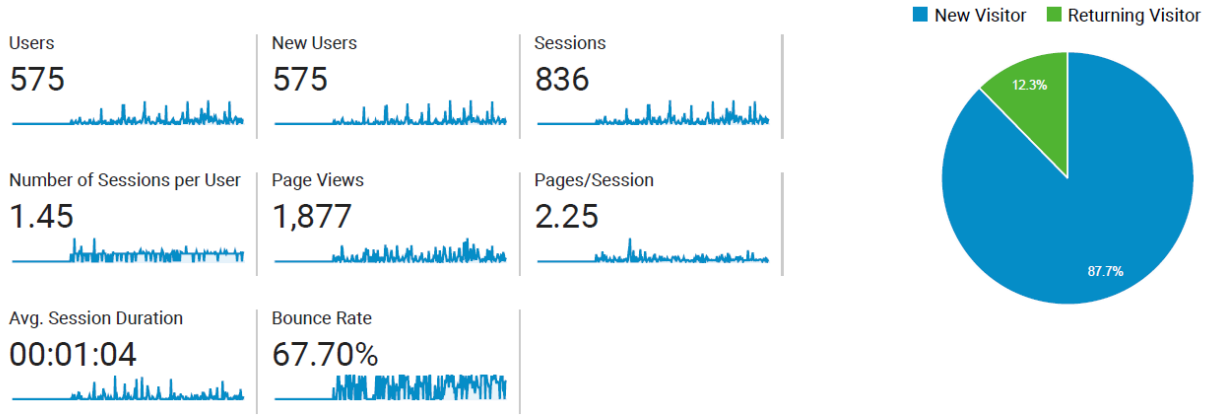

Figure 1. Number of visitors of the ProTego website

The project website has been launched at the end of February 2019. From the 1st of March until the beginning of December, the website has been visited 655 times. This number can be either derived from the statistics discussed in Sect. II.1.1.b, or from the Pie Chart shown in Figure 1. The website had 87.7% new visitors, which corresponds to 575 unique visitors over the 9 month that the project website is active. 12.3% of the 655 visits were made by returning visitors (i.e. 80 returning visitors).

Another observation in Figure 1 is that the bounce rate is relatively high. This means that most visitors specifically visit the website for certain information, for example the newest blog post, and then leave the website again.

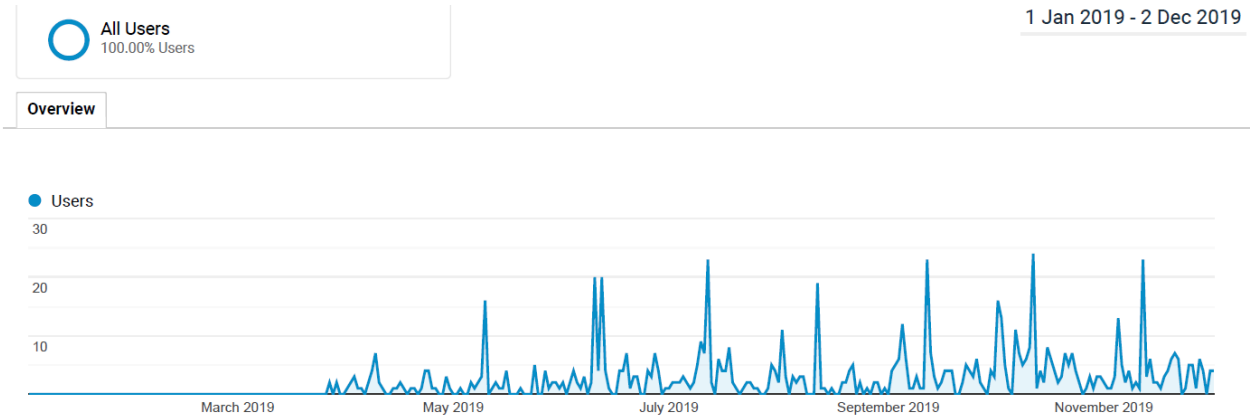

Figure 2. Evolution of the number of visitors (Jan-Dec 2019)

The figure above shows the evolution of the number of visitors over this 9 month period, on a daily basis. In the next section, we will zoom in more on the number of visitors per month. However, it is interesting to notice that one can clearly observe a regular pattern of peaks in the number of users visiting the website. Moreover, these peaks appear about once a month. This coincides with the publishing process of the monthly blogs. This clearly shows that the monthly blogs help in attracting visitors to the website. Other statistics, discussed later in this deliverable, confirm this observation as well.

II.1.1.b. Visitors per month

We can now zoom in a little bit more and study the evolution of the number of visitors per month. Below are the montly statistics, showing the number of visitors for each month in 2019:

- January 2019: 0 (website not active yet)
- February 2019: 0 (website not active yet)
- March 2019: 4 (4 new)
- April 2019: 32 (32 new)
- May 2019: 42 (35 new, 7 returning)
- June 2019: 89 (78 new, 11 returning)
- July 2019: 77 (60 new, 17 returning)
- August 2019: 60 (54 new, 6 returning)
- September 2019: 97 (87 new, 10 returning)
- October 2019: 139 (125 new, 14 returning)
- November 2019: 109 (96 new, 13 returning)
- December 2019: 6 (4 new, 2 returning) (*)

(*): statistics collected on the 3rd of December, so only 3 days in December.

In total, this corresponds to 575 new visitors and 80 returning visitors, or hence a total of 655 visits, as was already mentioned in the previous section. The figure below shows the evolution of the number of visitors from the moment of the launch of the website until the beginning of December. One can clearly observe an upwards trend in the number of visitors.

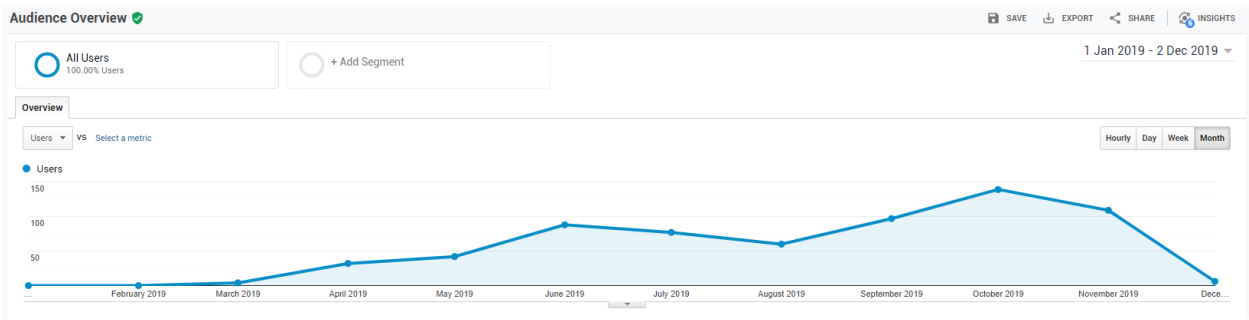

Figure 3. Evolution of the number of visitors on a monthly basis

II.1.1.c. Country statistics

The next question we investigated, is where the visitors are coming from. In this section, we looked at the country of origin. Later in this report, we will also investigate how users arrived on the ProTego website (e.g. via a search engine or a refferal from another website).

Figure 4 shows the top 10 of countries from which users visited the ProTego website. Not surprisingly, the countries from the consortium partners of the project are well represented in this graph. Nevertheless, some other countries are also relatively high in these charts, for example Ireland and the US. The number 1 position is taken by Spain. Again, this can be explained by the fact that multiple project partners within ProTego are from Spain. Moreover, multiple press releases of the project (see further in this deliverable) were particularly targeted towards Spanish stakeholders.

	Country	Users	% Users
1.	Spain	128	21.77%
2.	Ireland	114	19.39%
3.	Italy	60	10.20%
4.	United Kingdom	51	8.67%
5.	Belgium	44	7.48%
6.	United States	32	5.44%
7.	France	23	3.91%
8.	Greece	14	2.38%
9.	Israel	13	2.21%
10.	Portugal	12	2.04%

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Figure 4. Country of website visitors (statistics)

Figure 5 shows similar data, but then graphically depicted on a map of the world. Besides Africa and part of Asia, most of the regions in the world are covered. Besides the United States, the largest numbers of users are from European countries, as was also already shown in Figure 4.

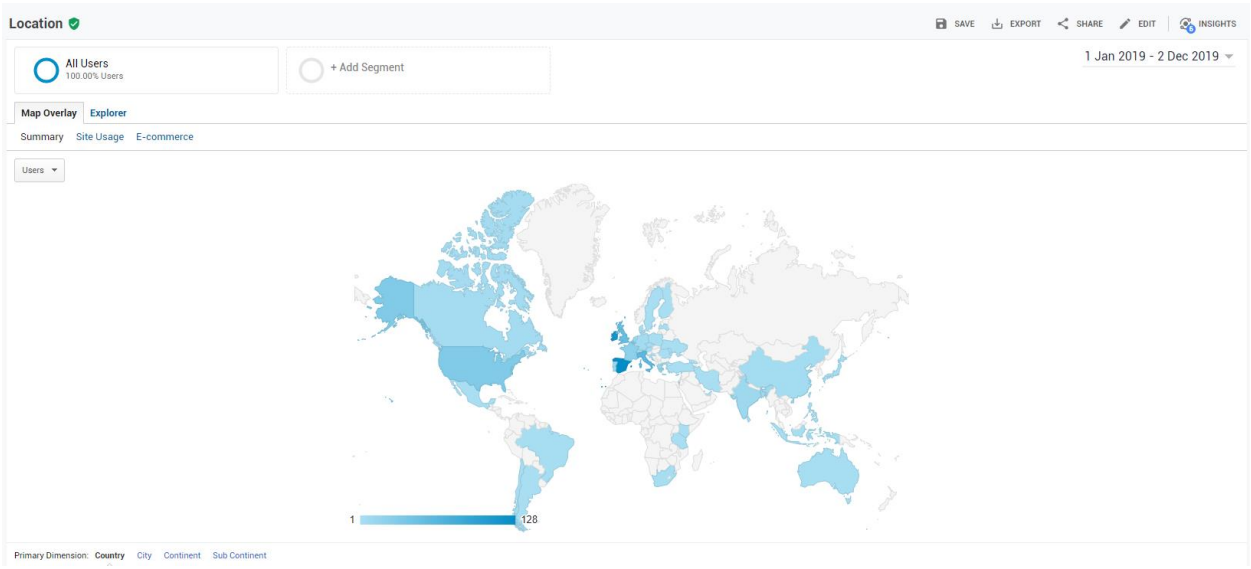

Figure 5. Country of website visitors (map)

II.1.1.d. Language statistics

Figure 6 below shows the language statistics of the visitors to the ProTego website. These statistics are obviously strongly linked to the country statistics discussed above.

	Language	Users	% Users
1.	en-us	268	46.37%
2.	es-es	92	15.92%
3.	en-gb	60	10.38%
4.	it-it	41	7.09%
5.	es	21	3.63%
6.	pt-pt	10	1.73%
7.	nl-nl	9	1.56%
8.	"en-us"	7	1.21%
9.	pt-br	6	1.04%
10.	en	5	0.87%

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Figure 6. Default language of visitors of the ProTego website

II.1.1.e. Page views

The total number of page views on the website, from the end of February until the beginning of December, is 1877 - as was already shown in Figure 1. Below one can find an overview of the number of page views per month.

- January 2019: 0 (website not active yet)
- February 2019: 0 (website not active yet)
- March 2019: 21
- April 2019: 156
- May 2019: 191
- June 2019: 246
- July 2019: 216
- August 2019: 163

- September 2019: 263
- October 2019: 373
- November 2019: 236

Figure 7 below shows the evolution of the page views per month. One can clearly see an upwards trend.

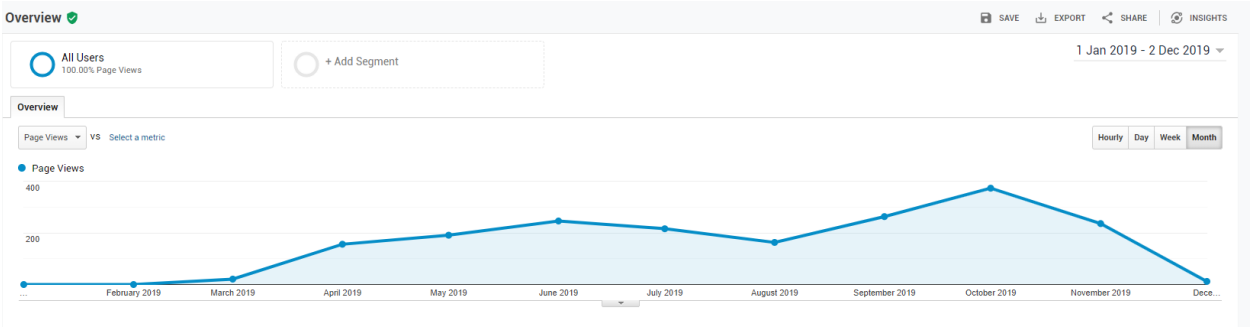

Figure 7. Page views per month.

II.1.1.f. Most visited pages

The top 3 of the most visited pages is: (1) home page, (2) monthly blogs, and (3) the project summary. More details can be found in Figure 8 below. These statistics again underline the value of publishing a monthly blog post on the website. Another interesting observation is that two entries in the top 10 are views of a specific blog post (the ones from March and May). In this case, visitors directly visited this blog post on the website, and did not first click on the 'monthly blog'-tab. The most likely reason for this is the announcement of these blogs via the ProTego twitter (e.g. via the following tweet: https://twitter.com/protego_project/status/1115250700148191237). These tweets contain a direct link to the specific blog posts.

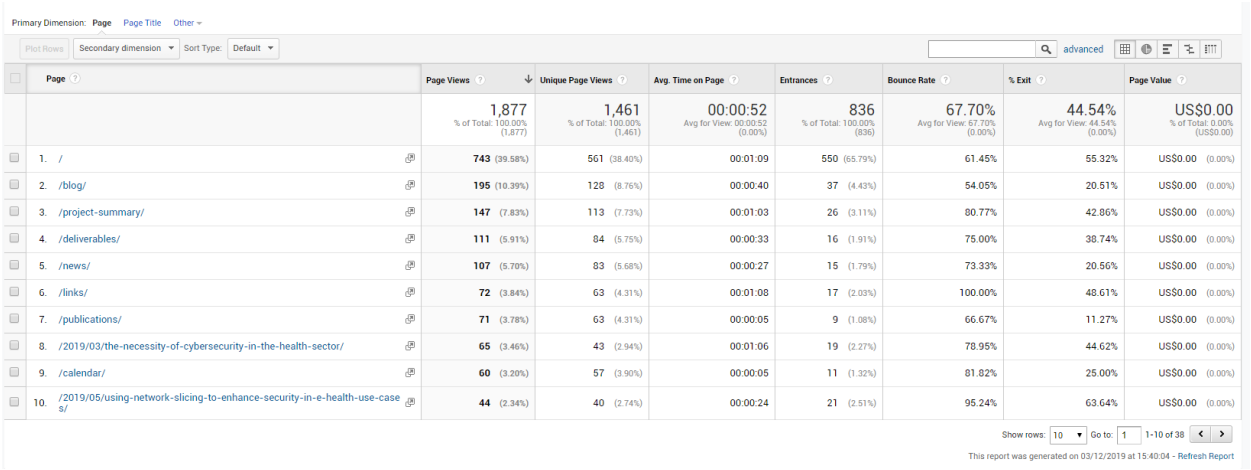

Figure 8. Most visited pages from the ProTego website

II.1.1.g. Traffic origin

Probably one of the most interesting stastics is the origin of the traffic to the ProTego website; i.e. did visitors directly enter the url of the website (https://protego-project.eu/) or did they enter via other means? For example, users could be redirected to the ProTego website via another site, such as a search engine.

If we have a look to the statistics, we can observe that most visitors go directly to the ProTego website (more than 56%). About 30% of the visitors find the ProTego website via search engines, and less than 10% are redirected to the website via social media. About 5% of the traffic is redirected to the ProTego website via other means. These statistics can be seen in Figure 9 and 10 below.

Figure 9. Origin of the traffic to the ProTego website (graph)

Primary Dimension: **Default Channel Grouping**

Secondary dimension | Sort Type: Default

Default Channel Grouping	Acquisition	
	Users ↓	New Users
	575 % of Total: 100.00% (575)	575 % of Total: 100.00% (575)
1. Direct	**333** (56.25%)	332 (57.74%)
2. Organic Search	**179** (30.24%)	174 (30.26%)
3. Social	**50** (8.45%)	43 (7.48%)
4. Referral	**30** (5.07%)	26 (4.52%)

Figure 10. Origin of the traffic to the ProTego website (statistics)

II.1.1.h. Traffic from social media

The statistics above show that about 8.5% of the users that visit the ProTego website were refered to the website via social media. Figure 11 shows that most of these visits come from Twitter. This is not a surprise, as ProTego has its own Twitter account. The account is used to announce updates on the website, such as new montly blog posts. The ProTego project does not have its own LinkedIn page or Facebook page, so these visits originate from social media posts published by one of the consortium partners (for example the LinkedIn posts to announce the start of the project or the launch of the project website).

Primary Dimension: Social Network

Secondary dimension

Social Network	Sessions	Page Views
1. Twitter	56 (65.12%)	152 (67.26%)
2. LinkedIn	24 (27.91%)	68 (30.09%)
3. Facebook	6 (6.98%)	6 (2.65%)

Figure 11. Website visitors originating from social media

II.1.1.i. Mobile vs desktop

Figure 12 shows that about 20% of the traffic to the ProTego website comes from mobile devices. The ProTego website is designed to be mobile-friendly, so that also mobile users can navigate the site effortlessly.

Primary Dimension: Device Category

Plot Rows | Secondary dimension | Sort Type: Default | advanced

Device Category	Acquisition			Behaviour			Conversions		
	Users	New Users	Sessions	Bounce Rate	Pages/Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	575 % of Total: 100.00% (575)	575 % of Total: 100.00% (575)	836 % of Total: 100.00% (836)	67.70% Avg for View: 67.70% (0.00%)	2.25 Avg for View: 2.25 (0.00%)	00:01:04 Avg for View: 00:01:04 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	US$0.00 % of Total: 0.00% (US$0.00)
1. desktop	453 (78.78%)	453 (78.78%)	687 (82.18%)	64.19%	2.43	00:01:14	0.00%	0 (0.00%)	US$0.00 (0.00%)
2. mobile	114 (19.83%)	114 (19.83%)	141 (16.87%)	83.69%	1.43	00:00:20	0.00%	0 (0.00%)	US$0.00 (0.00%)
3. tablet	8 (1.39%)	8 (1.39%)	8 (0.96%)	87.50%	1.25	00:00:22	0.00%	0 (0.00%)	US$0.00 (0.00%)

Show rows: 10 Go to: 1 1-3 of 3

This report was generated on 03/12/2019 at 15:53:15 - Refresh Report

Figure 12. Mobile vs desktop traffic

II.1.2. Analysis

The statistics obtained via Google Analytics, which were presented in the previous section, give some insights in the effectiveness of distributing project updates and results via the ProTego website. These statistics should not be over-analyzed, but nevertheless show some interesting insights. We already discussed most of the statistics in the section above. That is why we will only highlight a few conclusions:

1. The number of monthly visitors is growing. There is a clear upwards trend. This is a good evolution, since it means that our results and project progress are disseminated to more people. Obviously, a similar trend can be observed in the number of page views.
2. A large majority of the users visit the website directly, and are not redirected to the website via search engines or social media. This means that a large percentage of the users knows about the project, and wants to visit the website to learn more about ProTego.
3. Most visits to the website come from Spain. This can be explained by the presence of multiple Spanish partners in the consortium, and several dedicated articles which were released in local Spanish media.
4. The statistics clearly show the positive effect of publishing monthly blogs on the project website. Peaks in the number of visitors per day can be correlated to the publication of a new blog post, and the monthly blog posts are one of the most visited pages of the ProTego website.

II.2. Press releases and articles

Below, we discuss the communication activities in the categories of traditional media, online media and social media. These are respectively (1) press releases and articles in magazines and news papers, (2) articles posted on the project website (i.e. blog posts), and (3) posts on social media.

II.2.1. Press releases

Several articles have been published in the local Spanish press and in specialized medical journals to introduce the ProTego project to a large set of stakeholders. An overview is given below.

1. Title: El Hospital de Denia se defiende de ciber ataques [Dénia Hospital defences against cyber attacks]

   Article in local press (Denia) on 15/10/2019

   Url: https://www.denia.com/el-hospital-de-denia-se-defiende-ante-los-ataques-informaticos/

2. Title: El hospital de Dénia participa en un proyecto europeo contra los ataques informáticos en el ámbito de la salud [Denia Hospital takes part into an european project against cyber attacks in healthcare sector]

   Article in supra-local area press on 14/10/2019

   Url: https://lamarinaplaza.com/2019/10/14/el-hospital-de-denia-participa-en-un-proyecto-europeo-contra-los-ataques-informaticos-en-el-ambito-de-la-salud/

3. Title: El hospital de Dénia participa en un proyecto europeo contra los ataques informáticos en el ámbito de la salud [Denia Hospital takes part into an european project against cyber attacks in healthcare sector]

   Article in local press (Javea) on 15/10/2019

   Url: https://xabiaaldia.com/el-hospital-de-denia-participa-en-un-proyecto-europeo-de-ciberseguridad/

4. Title: Un proyecto para blindar la ciberseguridad en el sector sanitario europeo [A project to shield cyber security in European Healthcare sector]

   Article in specialized medical press on 21/10/2019

   Url: https://www.diariomedico.com/tecnologia/un-proyecto-para-blindar-la-ciberseguridad-en-el-sector-sanitario-europeo.html

5. Title: El hospital de Dénia, en un proyecto europeo de ciberseguridad [Denia Hospital takes part into a cyber security european project]

   Article in local press (Levante) on 15/10/2019

6. Title: El hospital de Dénia, en un proyecto europeo de ciberseguridad [Denia Hospital takes part into a cyber security european project]

   Article in local press (Canfali) on 19/10/2019

7. Title: El hospital de Dénia, en un proyecto europeo de ciberseguridad [Denia Hospital takes part into a cyber security european project]

   Article in local press (Las Provincias) on 15/10/2019

II.2.2. Articles

The consortium partners of the ProTego project have committed themselves to publish at least one blog post per month. By default, this blog post is posted on the project website, except for the first two articles (January and February 2019). These were articles posted on LinkedIn to announce the kick-off of ProTego and the launch of the project website. Once the project website was active, all subsequent blog posts (i.e. from March 2019 onwards) have been published on the website. This is typically done by the end of each month. The monthly blog posts discuss various topics related to ProTego. To spread the workload, each month a different consortium partner is responsible for writing the blog posts. Another advantage of this approach is that it automatically increases the variability in topics that are discussed. This schedule of publishing at

least one blog post per month will be maintained througout the entire duration of the project. Below one can find an overview of the blog posts from January to November 2019.

Date	Topic	Where?
January 2019	Kick-off of the ProTego project	LinkedIn
February 2019	Launch of ProTego website and general intro to project	LinkedIn
March 2019	The necessity of cybersecurity in the Health Sector	ProTego website
April 2019	Why addressing cyber risks in healthcare is needed	ProTego website
May 2019	Using network slicing to enhance security in e-health use cases	ProTego website
June 2019	Using Knowledge-based Systems to improve Big Data and Machine Learning methods for Cyber-security Threat Diagnosis	ProTego website
July 2019	Test Driving Parquet Encryption	ProTego website Medium.com
August 2019	Improving security in large scale medical it systems by managing complexity with standardization	ProTego website
September 2019	The Importance of Cyber Security User Awareness in Healthcare Industry	ProTego website
October 2019	On the insecurity of implantable medical devices	ProTego website
November 2019	Service-based secure network slicing	ProTego website

Table 1. Overview of monthly blog posts

II.2.3. Social media posts

The main social media communication channel of ProTego is Twitter. It is to the ideal tool to distribute short news items to a broad audience. The goal of using Twitter is twofold. First, it is used to announce short news items – for example a ProTego technical meeting that took place – so that people can stay up to date of the latest status of the project. Second, it is also used to trigger people to visit the project website, for example by announcing some small teasers (e.g. when a new blog post has been published on the project website).

In total, 24 tweets have been posted on the ProTego Twitter feed from the end of February until the beginning of December. The first tweet was posted on the 28th of February 2019 to announce the kickoff of the project and the launch of the project website. From that moment on, most tweets were related to:

- Project status updates of ProTego, for example a technical meeting that took place

- New blog posts that were posted on the ProTego website
- News related to security in healthcare from one or more of the consortium partners, for example novel scientific results
- Dissemination activities of the ProTego project, for example participation in healthcare conferences or symposia
- Press releases of the ProTego project

The number of Twitter followers of the ProTego project is currently 33.

II.3. Brochures and posters

One of the first tasks within WP8 was to create marketing material for the project. Therefore, at the beginning of the project, a leaflet and a poster have been created. We refer to deliverable D8.1 for more details on this marketing material.

The leaflet is designed to be visually attractive and to give a brief overview of the scope and vision of ProTego. Since the brochure is made in A5 format, it is very portable and hence can easily be distributed at any third-party events where ProTego is present. The leaflet is available on the internal Sharepoint of the project, so that any of the ProTego consortium partners can download and print it.

Similarly, the poster also gives an overview of the scope and vision of ProTego, as can be seen in Figure 13. The design of this poster is based on the ProTego colours and logo, and should be printed in A0-format. It is also available on the internal Sharepoint of the project.

Both the poster and leaflet contain the following information:

- ProTego logo and title
- High-level goal of the project
- Detailed objectives of the project
- URL of public website and Twitter account
- Overview of the consortium partners
- General project information
- EU logo and grant information (Horizon 2020)

In addition, the leaflet also gives a brief summary of the WP structure of the ProTego project.

All this information is mainly intended for introducing the ProTego project to any stakeholder generally interested in healthcare and security; i.e. to make this stakeholder aware that the ProTego project exists and which R&D challenges it is tackling. Until now, only this general-purpose leaflet and poster have been designed, as it was suitable for the dissemination events that were attended by ProTego during the first year of the project.

However, at certain events in the upcoming two years, one might want to only highlight particular aspects of the project (e.g. the SIEM developed in WP4), instead of giving a high-level general overview of the entire project. In that case, future versions of the leaflets and posters will have to be developed, of course based on the design of the current marketing material (to have a uniform look and feel). This will be done whenever necessary, on request of specific consortium partners in the project. This will allow this partner to disseminate the right information to the specific set of stakeholders as efficiently as possible. At other events, the general-purpose leaflet and poster of ProTego will suffice.

Figure 13. ProTego poster

II.4. Industry-oriented events and exhibitions

During the first year of the project, the consortium partners actively participated to three industry-oriented events and conferences that were relevant for the ProTego project. At these events, results and concepts of the ProTego project were presented to the other participants. The outcome of these participations is very successful. Besides dissemination to important stakeholders, it also contributed to long-term standardization efforts. The details are given below.

1. **Strata Data Conference**
    - Date and Location: 25/09/2019, New York (USA)
    - Title of presentation: Parquet modular encryption technology

- URL: https://conferences.oreilly.com/strata/strata-ny
- Context: Strata is the largest data conference series in the world. Formerly known as Strata + Hadoop World, the conference was created in 2012, when O'Reilly and Cloudera brought together their two successful big data conferences. The program of the conference covers the entire range of big data tools and technologies. The Strata Data Conference also covers current hot topics like AI and machine learning, and focuses on how to implement data strategies. There is a strong link between the scope of the conference and Apache Parquet – and likewise Parquet Modular Encryption, which is one of the main topics of WP5 within ProTego.

2. **APWG.EU**

- Date and Location: 02/10/2019, Barcelona (Spain)
- Title of presentation: Cybersecurity in Health Services
- URL: https://apwg.eu/eu-symposium-electronic-crime-research-2019/
- Context: The APWG.EU, established in 2013 as the Anti-Phishing Working Group European Foundation, is an industry association focused on unifying the global response to cybercrime. The organization provides a forum for responders and managers of cybercrime to discuss phishing and cybercrime issues, to consider potential technology solutions, to access data logistics resources for cybersecurity applications, to cultivate the university research community dedicated to cybercrime, and to advise government, industry, law enforcement and treaty organizations on the nature of cybercrime. Therefore, since ProTego aims to develop tools to assess and mitigate cybercrime risks and threats, the research outcomes of ProTego are certainly relevant for the participants of the APWG.EU symposium.

3. **FHIR DevDays conference**

- Date and Location: 21/11/2019, Amsterdam (The Netherlands)
- Title of presentation: Protego approach to scalability and security of healthcare data analytics
- URL: https://www.devdays.com/amsterdam
- Context: DevDays is an event for IT professionals in healthcare, whether new to FHIR or with previous experience, to learn about FHIR in a collaborative environment. DevDays offers a chance to work with the specification surrounded by others doing the same thing, side by side with experts to answer any questions. The three pillars for DevDays are: education, sharing of ideas and networking. It is important to mention that the talk of the ProTego project, given by Gidon Gershinsky of IBM Research, was attended by the HL7 FHIR leads. The outcome of this dissemination activity was very successful. A working relationship with this community has been established, and together with the person leading the FHIR Bulk Data standard, a formal channel for Parquet has been opened at fhir.org discussion stream - where the ProTego work will be leveraged to demonstrate the performance and security benefits of Parquet extension to the FHIR standard. The long-term goal of this effort would be to make Parquet a standard format for bulk transfer of healthcare data.

II.5. Community building activities

Besides participating to industrial events and conferences, the ProTego consortium partners also presented the project at various other relevant meetings and workshops in the healthcare domain. This increases the awareness of people working in the healtcare sector on the security solutions

that are being developed in ProTego, and could foster future collaboration and valorization trajectories.

More specifically, the following dissemination activities took place:

- Presentation of the ProTego project at the Virgen del Rocio University Hospital (Spain) on 02/04/2019.
- Presentation of the project at the Servicio Andaluz de Salud in Cadiz (Spain) on 04/10/2019.

II.6. Workshops

The ProTego project actively participated in two relevant workshops.

1. Workshop of the Data Market Service project.
    - ProTego took place in a workshop jointly organized in the UK with other H2020 projects, under the umbrella of the Data Market Service project funded by the European Commission under the grant agreement ID: 825014. ProTego participated by organizing a webinar on IoT and quality control processes. The webinar was launched on the 7th of October 2019. More details on the webinar can be found in Section II.7.3 below.
2. Workshop of the Spanish Society of Health Informatics
    - This workshop, organized by the Spanish Society of Health Informatics (SEIS), took place at the Canary Islands (Spain) on 20-21/11/2019. During this workshop, Luis Carrascal from GFI presented the ProTego project to the audience. https://seis.es/xvii-reunion-foro-salud-conectada-2019/

Figure 14. ProTego presented at SEIS workshop

II.7. University Education

The ProTego work and concepts are also disseminated via university education. This is done via different means: the organization of (1) a master thesis, (2) courses and lectures, and (3) seminars and webinars. It should be noted that these educational activities are not necesarily only targeted towards an academic audience and students. Seminars and webinars can be attended by any interested user, and some courses and lectures are even mainly oriented towards people from industry. Below, we give a brief overview of the most relevant activities.

II.7.1. Master Thesis

Within the context of ProTego, a master thesis has been organized at the University Vita-Salute San Raffaele in Italy. This thesis has been co-supervised by Diana Trojaniello from OSR – one of the partners of the ProTego consortium. This work is strongly linked to the activities of WP3 within ProTego. The details of the thesis are the following:

University: University' Vita-Salute San Raffaele Facolta' Di Psicologia -- Master of Science in Cognitive Psychology in Health Communication

Thesis title: Cybersecurity Awareness of Hospital Employees Using the Health Belief Model to predict cybersecurity behaviors

Candidate: Susanna Morlino

Supervisor: Alberto Sanna

Co-Supervisor: Diana Trojaniello

Abstract: The Master Thesis has been carried out within the H2020 European Project PROTEGO started in January 2019 about the topic of cybersecurity within the Center for Advanced Technology in Health and Wellbeing of San Raffaele Hospital.

Inside the project, the Master Thesis contributed to the next provision of an educational framework, assessing the cybersecurity awareness of the future target of this intervention, which is represented by the employees of San Raffaele Hospital (HSR). In particular, the educational framework will try to make employees more aware of cybersecurity threats in order to prevent cyberattacks, thus increasing an overall protection of health care IT systems and data. Measuring the actual cybersecurity behaviors of employees in order to evaluate the target at risk represents the starting point of this plan. In the study, the beliefs towards cybersecurity practices has been measured using the constructs of a behavioral model that has been widely used in health communication campaigns, namely the Health Belief Model. An ad hoc survey was developed basing on previous studies which have already applied the Health Belief Model to explain the cybersecurity behaviors of users in other contexts. Results showed that perceived severity, perceived barriers, self-efficacy and cues to action are decisive in determining cybersecurity behaviors. Additionally, two interaction effects have been observed: the technological expertise resulted to moderate the effect of perceived severity, while using electro-medical devices resulted to moderate the effect of self-efficacy on security behaviors.

II.7.2. Courses

Since the ProTego project is only ongoing for less than 1 year, the research results of the project have not been used yet in university courses and lectures. However, there is definitely potential for academic courses to be inspired by research outcomes of the ProTego project. As an example, we have identified a few KU Leuven courses where ProTego results from WP5 – and more particularly related to access control and key management – could potentially be disseminated.

- SecAppDev (https://secappdev.org/)

  SecAppDev is a yearly course jointly organized by two research groups from KU Leuven and is strongly oriented towards industry. SecAppDev teaches secure

software engineering, using an effective mix of theory and practice. Participants invest in a week-long journey into the intriguing world of software security, with topics ranging from integrating security into the development lifecycle, to the most recent Web security technologies. The course combines academic research and leading edge industrial security practices. Therefore, research outcomes from applied security research projects. such as ProTego. are fed into the content of this course.

- e-Security

  This course covers theoretical concepts like access control matrices and security policies, and is taught to engineering students. The course mainly tackles basic technological concepts from the state-of-the-art. However, ProTego could be used as a practical realization of some access control concepts.

- Introduction to ICT Security

  The course discusses access control and cryptographic mechanisms. First it focuses on access control in a centralized setting and cryptography for entity authentication. Next, it also focuses on more complex settings, such as access control in distributed systems. Similarly as the course on e-security, ProTego could be used as an example of a practical realization.

II.7.3. Seminars and Webinars

One webinar and one research seminar have been given in the context of ProTego. An overview is given below.

Webinar

Main author: Nicholas Fair (IT Innovation)

Title: Risk Analysis, Policy Compliance and Elements of GDPR - SSM tool

URL: https://learnssm.it-innovation.soton.ac.uk/?course=risk-analysis-policy-compliance-and-elements-of-gdpr

Contributors (including ProTego): https://learnssm.it-innovation.soton.ac.uk/?page_id=383

Context: This webinar discusses the SSM tool which has been partially developed in the ProTego project. As was also mentioned above, the webinar itself has been developed as part of the Data Market Service project funded by the European Commission under the grant agreement ID: 825014.

Research seminar

Author: Seyed Farhad Aghili

Title: Toward lightweight authentication and access control schemes for IoMT

Abstract: The use of the Internet of Things (IoT) in electronic health (e-health) management systems entails many challenges, including secure communications through insecure radio channels, authentication and key agreement schemes between the entities involved and access control mechanisms. Such a system, in which the patient is equipped with different resource-constrained sensors and a doctor can monitor her/him remotely and instantly and know her/his vital signs online, is called the Internet of Medical Things (IoMT). Because of the use of resource-limited sensors in IoMT, the schemes that are designed for IoMT should be efficient. Moreover, using mobile entities in IoMT systems provides attackers the opportunity to compromise entities and impersonate legal entities to access vital information. Thus, several questions arise, like: Is it possible to propose a secure protocol that can cover compromised entity challenges among

each other? How to model a lightweight proactive authentication and key agreement scheme to satisfy the security and privacy in IoMT systems? Is it possible to design a scheme where each user can access the part of the data to which s/he has access?

Context: This research seminar is given internally in KU Leuven on 25/11/2019 within the context of the ProTego project. The seminar was given to PhD researchers and master students working on cryptography and (embedded) security. It discusses the technique of attribute-based encryption, which will be studied as an enhancement of the current access control solution being developed in ProTego.

II.8. Open access

Open access provides world-wide and immediate online access to research outputs at no cost to the reader, including the right to fully use these outputs digitally. Open access prevents duplication, fosters knowledge and technological transfer and promotes innovation. Therefore, it is an important aspect to be considered in all dissemination and communication actions.

II.8.1. ProTego commitment

The ProTego project commits to fully support the open access policy. Therefore, the project consortium will publish all public research outcomes of the project under the terms of open access. More details can be found in the next subsection of this deliverable.

The consortium is convinced that open access can be a win-win situation. Thanks to open access, research results are distributed quickly and are freely accessible through the Internet. Therefore, the general public gets access to research and can see the result of funded research projects like ProTego. However, an additional benefit is that open access allows to increase the visibility of the research, and hence the likelihood of research results being used by other researchers and stakeholders. Therefore, open access could be a leverage to the valorization and exploitation strategy of the project.

II.8.2. ProTego actions towards Open Access

Several actions are taken by ProTego towards supporting the open access policy. The project consortium will publish all not confidential material and publications under the terms of Open Access. In case of confidential material, the consortium will investigate if (part of) the research data could be made available in an anonymized way. This will be considered on a case-by-case basis. From a high-level point of abstraction, the main research outcomes of the project will be (1) publications/reports, and (2) data/implementations. For both categories, open access is relevant, and appropriate actions will be taken.

All public research reports and deliverables will be made available to the public via the project website of ProTego. The authors will publish their articles in open access journals to make the publications freely available to end-users, unless there is a very strong reason not to do so. Many conferences and journals have at least green open access, meaning that self-archiving is allowed. Therefore, all published articles and papers will be provided on the project website of ProTego. Two options are foreseen. Either the pdf of the article can be downloaded via the website, or there is a link to the external website where the article can be freely downloaded (for example the website of the research group of the author).

Whenever possible, the consortium commits to produce non-confidential open data that can be shared with other researchers. Again, there are two options on how to provide access to this data to interested stakeholders. The first option is that the researcher who generated the data, stores it on its own local infrastructure. A reference to this data is then inserted in the research article – when applicable – and/or on the project website. This might be done by introducing a new subcategory on the project website, in addition to deliverables and publications, or it can be included in the subcategory ‘Publications’. The second option to make the open data accessible would be to combine all efforts on project level, and go for options like Zenodo

[https://zenodo.org/]. A new community, “ProTego”, would then be created on this open access repository. In this case, all open data generated by ProTego would be made available via this community, so that users can immediately find all the data of the project. Alternative solutions – similar to Zenodo – could of course be considered as well.

III. Conclusion

In this deliverable, an overview has been provided of the dissemination and communication activities that were carried out by the consortium members of the ProTego project during the first project year. These activities included:

- Creation and maintenance of a public project website
- Press releases and articles in local and specialized media
- Social media post, mainly targeted towards attracting visitors to the public project website
- Creation of a poster and brochure of ProTego, containing the basic project information
- Active participation in industry-oriented events and conferences related to ProTego
- Creating awareness of ProTego in relevant communities, such as local hospitals
- Active participation in workshops
- Dissemination of the project through university education, for example via master theses or research seminars

The website statistics – based on Google Analytics – show that the number of visitors is increasing each month. Particularly the monthly blog posts published on the project website attract new and recurring visitors. One of the other successful dissemination actions carried out during the first project year was the active participation at the FHIR DevDays conference. This has contributed to the establishment of a working relationship with the HL7 FHIR community, with the long-term goal of contributing to the FHIR specification.


ProTego