Horizon 2020 Programme

H2020-SU-TDS-02-2018
Trusted digital solutions and Cybersecurity in Health and Care

DATA-PROTECTION TOOLKIT REDUCING RISKS IN HOSPITALS AND CARE CENTERS

Project Nº 826284

ProTego

D8.7 Report on the 3rd period dissemination and communication activities and results

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Document Reference:	D8.7
Dissemination Level:	Public
Version:	1.0
Date:	31/12/2021

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 third and final project year. More specifically, it provides an overview of the activities from December 2020 up to November 2021 and gives an outlook to the dissemination and communication activities that are still planned in December 2021. In this deliverable, we will report on the following categories of dissemination and communication activities: (1) project website, (2) scientific, peer-reviewed publications, (3) whitepapers, (4) press releases, social media and monthly blog posts, (5) organisation of workshops, (6) active participation in workshops and events, (7) project videos, and (8) synergies with other projects. For each of the categories, the specific actions and results will be presented. The activities discussed in this deliverable complement the dissemination and communication activities of the first and second project year, which were reported in deliverable D8.3 and D8.5 respectively. These will not be repeated in this report.

The main achievements with respect to dissemination and communication are as follows. A workshop was organised jointly with 4 other Horizon 2020 projects. In addition, synergies with these and other projects have been explored with the goal to increase the impact created by ProTego. In April 2021, a specific website dedicated to the ProTego Cyber Security Awareness Platform has been launched, including 4 educational videos produced by the consortium. Despites it launch in April, this new website accounts for 50% of the total page views on ProTego websites this year. The preparation for a general project video have been started. This video will be recorded beginning of 2022, and will be used in social media and communication campaigns. Moreover, it will also support the exploitation activities of the individual project partners.

An important number of new scientific publications have been published, bringing the total number of publications to 22 (+ 6 currently under review). All accepted ProTego publications are released to the general public via an open repository.

We conclude this report with a final status update of the dissemination activities in ProTego with respect to the (revised) KPI targets. In short, we have reached all the target KPIs and exceeded the target values for most of these.

Contributors Table

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Table of Acronyms and Definitions

Acronym	Definition
CP	Communication Plan
IoT	Internet of Things
KPI	Key Performance Indicator
R&D	Research and Development
RDP	Results Dissemination Plan
SEO	Search Engine Optimisation
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.

The communication and dissemination plan described in deliverable D8.1 included several dissemination KPIs that have been set as target goals. However, due to the COVID19 pandemic, there was a need to refine some of the KPIs. We refer to deliverable D8.5 for a detailed overview of the revised dissemination plan and related KPIs. From 2021 onwards, the refined KPIs of D8.5 have been used as a guideline to track the overall progress of the dissemination activities in the remainder of the project. Therefore, at the end of this deliverable, we will report on the (final) status of all these revised dissemination KPIs at month 35 of the ProTego project.

Before this final status update of the revised dissemination KPIs, an overview will be given of the current status of all dissemination and communication activities from December 2020 until the beginning of December 2021 (i.e. more or less the third project year, excluding the last 3 weeks of the year). Where necessary, some extra context will be given. A similar overview was published at the end of the first and second project year respectively in deliverable D8.3 and D8.5. Since this is the last deliverable in WP8 reporting on dissemination activities, D8.7 will also report on the few remaining dissemination activities that are still planned in the near future (i.e., in the last weeks of December 2021 or beginning of 2022).

In the next sections of this deliverable, an overview of the different activities will be given[1]. This overview is structured according to the specific dissemination and communication activity. These are respectively:

- Project website
- Scientific publications
- Whitepapers
- Press releases, online articles (monthly blog posts) and social media posts
- Organisation of workshops
- Active participation in workshops and events
- Project videos
- Synergies with other projects

[1] In this overview, some introductory text from deliverables D8.3 and D8.5 is reused in this deliverable, to ensure that this deliverable stands alone.

II. Project Website

An important dissemination and communication tool of the ProTego project is the project website. 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/

More information about the design of the website can be found in Deliverable D8.1. Recall that from 2020 onwards, Search Engine Optimisation (SEO) has been applied to increase the visibility of the website through search engines. We refer to Deliverable D8.5 for more detains on this topic.

In 2021, two important changes have been made to the project website. First of all, there is now a tab for the ProTego whitepapers. Second, an extra website has been created for the Cyber Security Awareness Platform. Technically this is a different website, but to the outside world it looks like a subpage of the main website. The link to this platform is as follows:

https://protego-project.eu/cybersecurity/

To ensure that all the information related to ProTego remains accessible after the end of the project, the consortium commits themselves to keep the ProTego website online for at least 1 year after the end of the project. After that date, it will be re-evaluated whether this data will be further prolonged or not.

Below, we will give an overview of some statistics related to the ProTego project website. Note that we will use exactly the same statistics as mentioned in Deliverable D8.3 and D8.5, to allow to compare the statistics of the first, second and third project year. We will start with the main ProTego website, and then look to the statistics of the Cyber Security Awareness Platform website.

II.1. Statistics of the main ProTego website

To monitor the website statistics and support the reporting, we have enabled Google Analytics in the ProTego project website. The statistics discussed below are all derived from the available dashboards, and show the results from December 2020 up to November 2021. It is important to stress that all statistics in Section II.1 are **only related to the main ProTego website**. In other words, the **visits to the Cyber Security Awareness Platform are not included in the statistics below**, and will be discussed separately in Section II.2. This is important to take into account when analysing the website statistics.

II.1.1. 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.

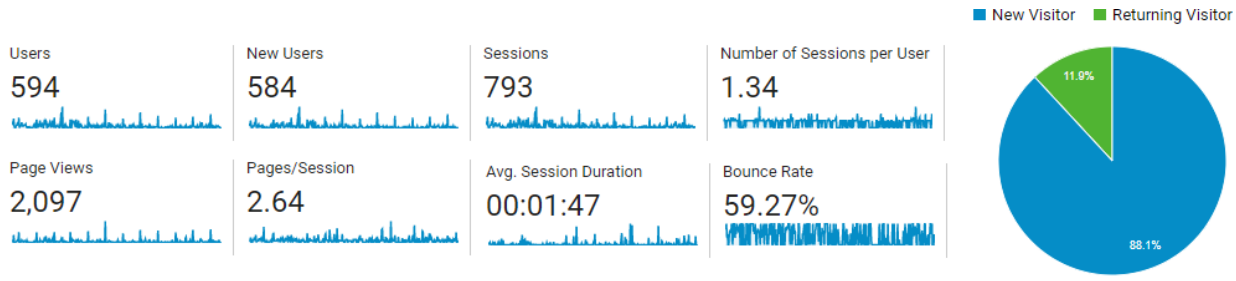

Figure 1. Number of visitors of the ProTego website

In the last year, the website has been visited by 594 unique users. This number of visitors is lower compared to previous years. The main reason for this is that the visitors to the Cyber Security

Awareness Platform are excluded from the numbers above. If these are added, then the numbers are even higher compared to last year.

The Pie Chart on the right in Figure 1 shows that 88.1% of the visitors to the website are new visitors, and 11.9% are returning visitors. This percentage is very similar to the number of last year.

Compared to last year, the bounce rate has slightly dropped to 59%. Nevertheless, this number is still relatively high. This means that +/- 59% of the visitors specifically visit the website for certain information, for example the newest blog post, and then leave the website again. This is also reflected by the number of pages that are visited per session, which is relatively low (2.64 pages per session). This number has slightly increased compared to the last years (2.25 in 2019 and 1.97 in 2020). This increase could be explained by the fact that there is more content available on the ProTego website.

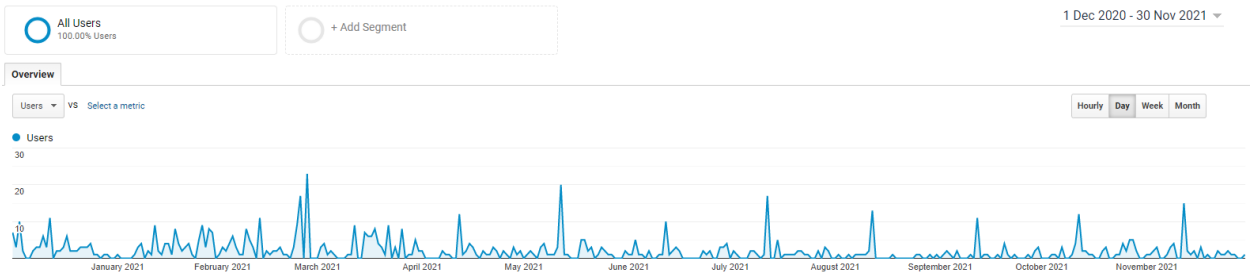

Figure 2. Evolution of the number of visitors (Dec 2020 – November 2021)

The figure above shows the evolution of the number of visitors over the last year, on a daily basis. In the next section, we will zoom in more on the number of visitors per month. Similarly to last years, one can observe several peaks in the number of users visiting the website. These are most likely the result of publishing a new monthly blog post on the website. Last year, there was also an increase in visitors in August and September 2020, related to the ProTego workshop that was organised. This trend is not visible (or at least less outspoken) this year, when ProTego co-organised a workshop in April 2021.

II.1.2. 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 the last year:

- December 2020: 74
- January 2021: 74
- February 2021: 105
- March 2021: 74
- April 2021: 45
- May 2021: 57
- June 2021: 36
- July 2021: 43
- August 2021: 25
- September 2021: 25
- October 2021: 44
- November 2021: 40

If we analyse these numbers, one can make several observations:

- The number of visits during the first months of 2021 is similar to the number of visits in the 2nd half of 2020. These numbers are roughly varying between 70 and 100.
- From April 2021 onwards, there is a clear drop in the number of visits. From that month onwards, the numbers are relatively stable again – although clearly lower than the numbers of January to March – except for the summer period. Not surprisingly, April 2021 exactly corresponds to the launch of the Cyber Security Awareness Platform. Because the visitors to this new website are not included in the statistics of the main ProTego website, as was already mentioned above, the numbers show a drop from April onwards.
- The number of visits did not increase due to the workshop co-organised in April 2021.

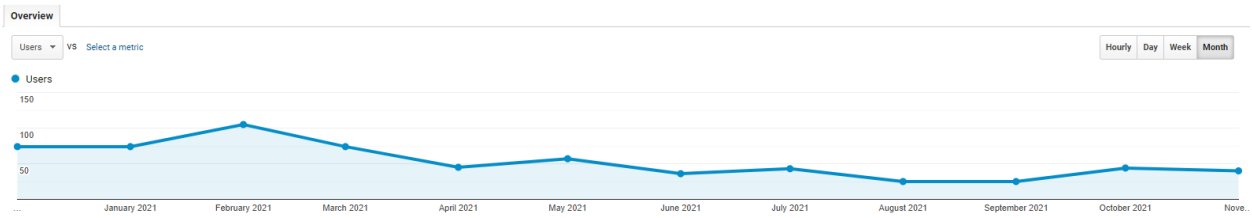

Figure 3. Evolution of the number of visitors on a monthly basis

II.1.3. 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. This top 10 is very similar to the one of last year. The countries from the consortium partners of the project are well represented in this graph. It is also clear that the number of visits from the top 2 countries is clearly higher than the visits from the other countries, and that the top 6 countries represent more than 75% of the total visits.

	Country	Users
1.	Ireland	136 (22.67%)
2.	Spain	117 (19.50%)
3.	United Kingdom	59 (9.83%)
4.	Italy	49 (8.17%)
5.	United States	48 (8.00%)
6.	Belgium	43 (7.17%)
7.	India	14 (2.33%)
8.	France	13 (2.17%)
9.	Germany	9 (1.50%)
10.	Greece	8 (1.33%)

Figure 4. Country of website visitors (statistics)

Figure 5 shows similar data, but then graphically depicted on a map of the world. There are no important changes compared to last year. A slightly larger number of regions in the world are now covered in 2021. However, not surprisingly, given that the ProTego project is a European R&D project, the largest numbers of users are from European countries, as was also already shown in Figure 4.

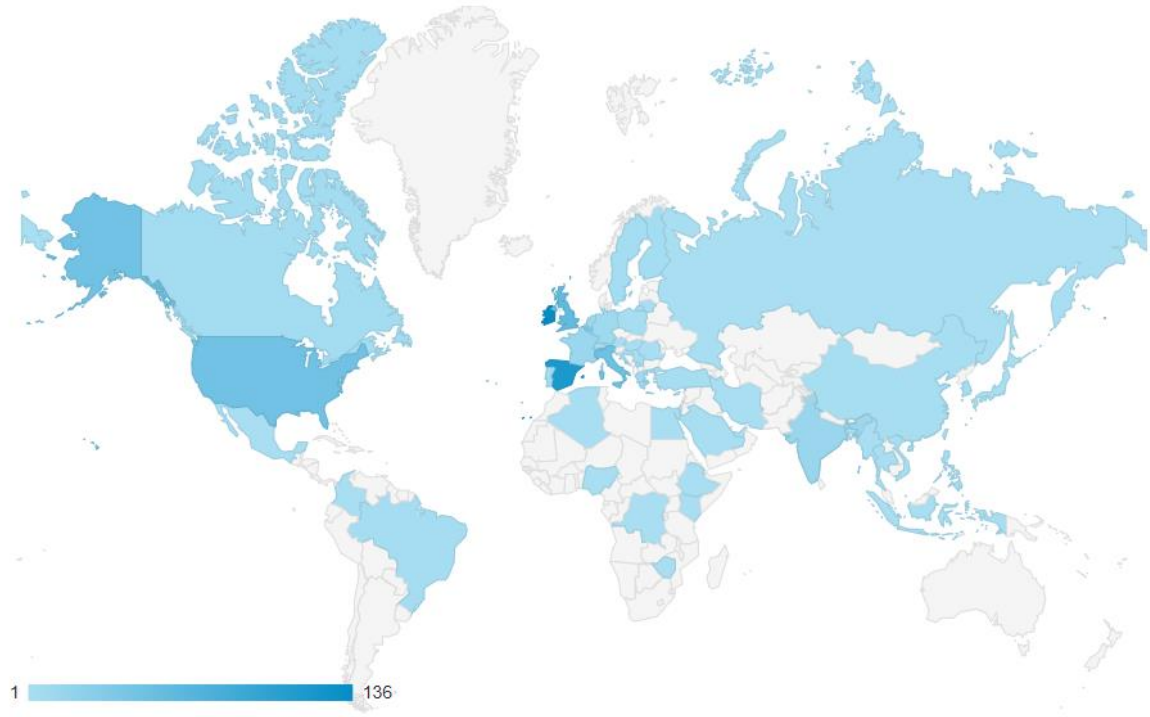

Figure 5. Country of website visitors (map)

II.1.4. 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	289	48.57%
2.	en-gb	70	11.76%
3.	es	61	10.25%
4.	es-es	46	7.73%
5.	it-it	36	6.05%
6.	nl-nl	21	3.53%
7.	fr-fr	8	1.34%
8.	en	5	0.84%
9.	de-de	4	0.67%
10.	nl-be	4	0.67%

Figure 6. Default language of visitors of the ProTego website

II.1.5. Page views

The total number of page views on the website, from December 2020 until the end of November 2021, is 2097 - as was already shown in Figure 1. Again, it is important to stress that this drop in page views is caused by the launch of a new website (Cyber Security Awareness Platform), whose statistics are not included in the ones of the main website. An interesting observation is that the decrease of page visits is relatively lower than the decrease in number of visitors. The reason for this is because each user visits on average more pages per visit, compared to last years. Below one can find an overview of the number of page views per month.

- December 2020: 221
- January 2021: 229
- February 2021: 232
- March 2021: 195
- April 2021: 146
- May 2021: 201
- June 2021: 124
- July 2021: 152
- August 2021: 100
- September 2021: 160
- October 2021: 188
- November 2021: 149

These numbers are strongly related to the number of visitors per month. Both statistics have a strong correlation and follow more or less the same trend. However, there are also a few interesting differences as well.

- The drop in page views from April 2021 onwards, caused by the launch of the Cyber Security Awareness Platform website which is not included in these statistics, is less outspoken than the drop in visitors discussed above.
- After the summer break, the numbers increase again to a slightly lower number than the first half of 2021.
- Except for the drop in April and during the summer break, the number of page views is relatively more stable than the number of visitors.
- The number of page views per month is also more stable compared to previous years.

This can also be seen in Figure 7 below, which shows the evolution of the page views per month.

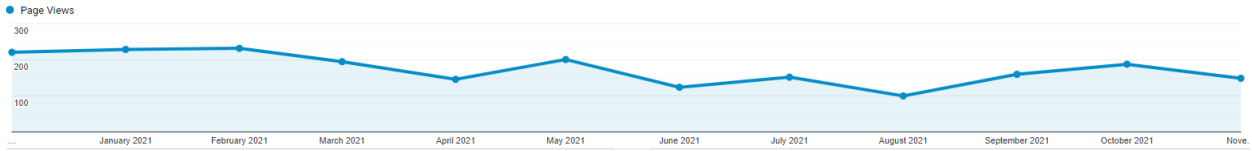

Figure 7. Page views per month.

II.1.6. Most visited pages

The top 4 of the most visited pages is: (1) home page, (2) monthly blogs, (3) the project summary, and (4) publications. More details can be found in Figure 8 below. These most visited pages are very similar to the most visited pages of last year, the only difference is the blog post of February 2020 which is obviously no longer in the top 4 of 2021. Instead, the ProTego publications are now on the 4th place in this ranking. The statistics again underline the value of publishing a monthly blog post on the website, an observation that was also made last years. Another recurring observation is that two blog posts are within the top 10 of most visited pages. In these cases, the visitors directly visited this blog post on the website, and did not first click on the 'monthly blog'-tab. Most likely, the users were directed to this blog post via social media posts or via an online search query.

In 2019, about 40% of the users visited the home page of the project website. In 2020, this number had decreased to 33%. In 2021, it further decreased to 25%. The other numbers remained relatively stable compared to last year, except of course for the blog post of February 2020.

	Page	Page Views	% Page Views
1.	/	525	25.04%
2.	/blog/	151	7.20%
3.	/project-summary/	106	5.05%
4.	/publications/	82	3.91%
5.	/links/	74	3.53%
6.	/news/	68	3.24%
7.	/deliverables/	67	3.20%
8.	/calendar/	59	2.81%
9.	/2020/06/apache-parquet-for-hl7-fhir/	44	2.10%
10.	/2021/09/protego-advanced-research/	36	1.72%

Figure 8. Most visited pages from the ProTego website

However, an important observation needs to be made when analysing these numbers. When also considering the visits to the Cyber Security Awareness Platform website, which is not included in these statistics, this page is actually visited more than the pages shown in Figure 8. More specifically, as will be shown later in this section, the Cyber Security Awareness Platform page has been visited 2012 times. This is clearly higher than any of the other pages in the top 10 above and therefore is actually the correct number 1 in the ranking.

II.1.7. 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 33% of the visitors find the ProTego website via search engines, and less than 2% are redirected to the website via social media. About 8% of the traffic is redirected to the ProTego website via other means. These statistics can be seen in Figure 9 below.

Compared to last year, the relative number of visitors that directly go to the ProTego website has increased, and the number of visitors via search engines decreased. The other numbers (referral and social media) are significantly lower and relatively similar to last year.

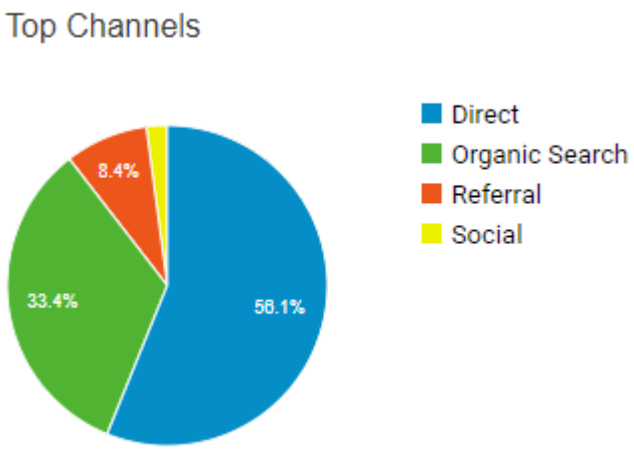

Figure 9. Origin of the traffic to the ProTego website (statistics)

II.1.8. Mobile vs desktop

Figure 10 shows that about 13% 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. Compared to last year, the balance between mobile and desktop traffic has slightly changed towards more desktop traffic.

		594 % of Total: 100.00% (594)
☐	1. desktop	**516** (86.87%)
☐	2. mobile	**76** (12.79%)
☐	3. tablet	**2** (0.34%)

Figure 10. Mobile vs desktop traffic

II.2. Statistics of the Cyber Security Awareness Platform website

In the previous subsection, we extensively analysed the statistics of the main ProTego website. As was already mentioned, for technical reasons these statistics do not include the ones from the Cyber Security Awareness Platform website which was launched in April 2021. We will limit ourselves to the main statistics of this platform.

Figure 11 shows the number of visitors and page views of the Cyber Security Awareness Platform website. These are respectively 1331 and 2012. In Figure 12, we show the number of page views over time. One can clearly see that there is strong activity between roughly April and July 2021, when this website has been launched to support the WP3 activities in the project.

	Session medium	Users	Sessions
	Totals	1,331 100% of total	2,012 100% of total
1	(none)	1,204	1,838
2	referral	126	161
3	organic	1	12
4	(not set)	9	1

Figure 11. Number of visitors and page views of the Cyber Security Awareness Platform website

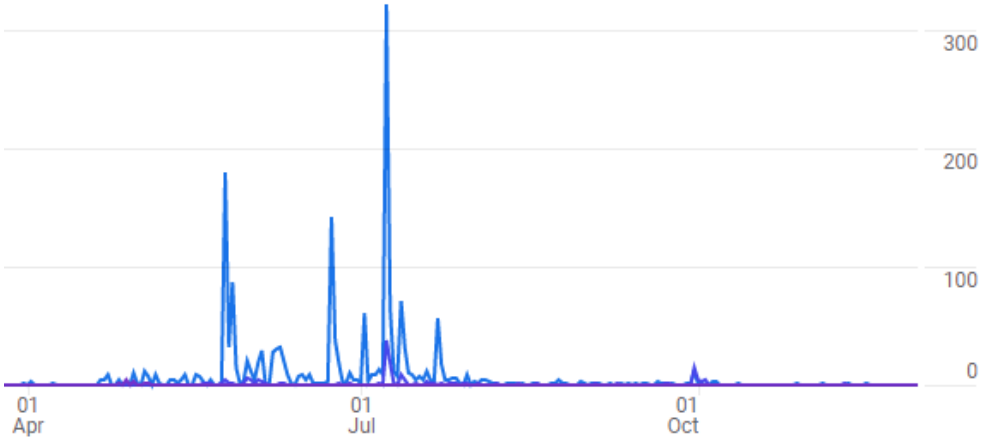

Figure 12. Page views of the Cyber Security Awareness Platform website over time

II.3. Analysis

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

1. When combining the statistics of both ProTego websites, the total number of users visiting the website is 1925. This is about 50% more than the number of visitors last year. However note that the actual total number of visitors might be slightly lower, as users going directly from one website to the other one are counted as two different users. However, based on the statistics of the referrals, this over-estimation of the number of visitors can be expected to be relatively limited.
2. When combining the statistics of both ProTego websites, the total number of page views to either of the websites is 4109. This is a 25% increase compared to the number of page visits last year. It is also interesting to note that both the main ProTego website and the Cyber Security Awareness Platform website have a similar number of page views. This shows the relative importance of the Cyber Security Awareness Platform website (i.e., it accounts for 50% of the page views).
3. When looking solely to the main ProTego website, most visitors search for general project information, ProTego publications and deliverables, and particularly the monthly blogs. This positive impact of the monthly blog posts was already observed last years, and gets again confirmed in this year's statistics.

III. Scientific Publications

The ProTego project is a Research and Innovation Action. Therefore, peer-reviewed scientific publications are an important means to disseminate the project's research findings and outcomes to relevant stakeholders within the scientific and R&D community. Therefore, one of the main dissemination goals of the ProTego project is to prepare high-quality scientific publications and submit these to peer-reviewed journals and conferences.

In WP8, we track the number of published and accepted publications, but deliberately do not further split this into further subcategories such as journals and conferences. The reason is that different scientific fields are represented in the ProTego consortium (cybersecurity, cryptography, computer science, wireless networking, health, social sciences, etc.), and each of these domains have their specificities. This significantly impacts the choice of the conference or journal to submit the work to. For example, research within the cybersecurity domain is most often submitted to scientific conferences, where articles are peer-reviewed and the acceptance rate is very low. In other domains, journals are the preferred dissemination venue to have the largest scientific impact. Therefore, we leave it up to the researchers to identify the most appropriate dissemination venue for their scientific publication.

A second aspect that has to be considered when reporting on scientific publications in a project, is the time between the submission of the article and the actual publication of the article. Depending on the specific journal or conference, this can vary between a few months and more than half a year (even up to more than a year in some specific cases). As a result, there are currently several papers which are still under review, and which will be accepted after the end of the project. Nevertheless, the ProTego consortium commits themselves to manage these future publications similarly to the ones accepted and published during the project (i.e, open access to the paper, correctly mentioning the funding source, etc.).

In the overview below, we present the scientific peer-reviewed publications of the ProTego project, from the start of the project up to December 2021. We group these publications into the following categories: (1) Published and accepted publications, (2) Submitted publications (these publications are currently being peer-reviewed, but the outcome of this evaluation process is not yet known), (3) Publications still under preparation (we limit ourselves to publications that are ready to be submitted within the next 1-2 months at most). All published papers can be downloaded from the ProTego project website, or from the ProTego Zenodo repository: https://zenodo.org/communities/protego/

The ProTego consortium commits itself to continue to manage this Zenodo repository in 2022, to ensure that all ProTego publications currently still under review will be publicly accessible once they are accepted.

Published and accepted publications

1. "Airtime-based Resource Allocation Modelling for Network Slicing in IEEE 802.11 RANs", Pedro Heleno Isolani, Nelson Cardona, Carlos Donato, Guillermo A. Perez, Johann Marquez-Barja, Lisandro Zambenedetti Granville, and Steven Latre. IEEE Communications Letters. pp 1077-1080. May, 2020. ISBN 1089-7798. DOI 10.1109/LCOMM.2020.2977906.
2. "An SDN-based framework for Slice Orchestration using In-Band Network Telemetry in IEEE 802.11", Pedro H Isolani, Jetmir Haxhibeqiri, Ingrid Moerman, Jeroen Hoebeke, Johann M. Marquez-Barja, Lisandro Zambenedetti Granville, Steven Latre. 6th IEEE Conference on Network Softwarization (NETSOFT2020). pp 344-356. June, 2020. Ghent, Belgium . ISBN 978-1-7281-5684-2. DOI 10.1109/NetSoft48620.2020.9165358.
3. "Enabling QoS-secured Enhanced Non-Public Network Slices for Health Environments", Henrique C. Carvalho de Resende, Joao Paulo de Brito Goncalves, Cristiano B. Both, Johann M. Marquez-Barja. 6th EAI/ACM International Conference on Smart Objects and

Technologies for Social Good (GOODTECHS20). pp 18-23. September, 2020. Antwerp, Belgium . ISBN 978-1-4503-7559-7/20/09. DOI 10.1145/3411170.3411244.

4. “Db2 Event Store: A Purpose-Built IoT Database Engine”, C. Garcia-Arellano, G. Gershinsky, et al. International Conference on Very Large Data Bases (VLDB), August 2020.
5. “A Framework for BYOD Continuous Authentication: Case Study with Soft-Keyboard Metrics for Healthcare Environment”, Luis de-Marcos, Carlos Cilleruelo, Javier Junquera and José-Javier Martínez-Herráiz. International Conference on Applied Informatics (ICAI2020), October 2020, pp. 347-358, Springer-Verlag. DOI 10.1007/978-3-030-61702-8_24.
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Submitted publications (under review)

1. Cybersecurity Attack Detection System based on Self-Attention Multilayer Perceptron (submitted to: Computers & Security)
2. SAKE+: Strengthened Symmetric-Key Authenticated Key Exchange with Perfect Forward Secrecy for IoT (submitted to: IEEE TIFS journal)
3. Secure and Practical Key Establishment for New Generations of Implantable Medical Devices (submitted to: ACM AsiaCCS 2022)
4. MLS-ABAC: Lightweight Multi-Level Security Attribute-Based Access Control scheme (submitted to: FGCS journal)
5. Mobile keystroke dynamics as a behavioral biometric: a cross-session. (submitted to: Applied Sciences journal)
6. Systematic Literature Review in Continuous Authentication (submitted to: Journal of Network and Computer Applications)

Planned publications

1. Trust in medical data governance: a developer perspective. Automated ISO 27005 risk assessment using attack path analysis in a health care environment.
2. Technology acceptance of healthcare apps and how ProTego security measure can lower barriers to acceptance.

IV. Whitepapers

The research results of the ProTego project are described in scientific papers. These have been discussed in the previous section. However, these scientific papers typically only focus on one specific research outcome, and hence do not provide the reader the bigger picture (e.g., how does ProTego provide data protection?, how to perform system monitoring and threat modelling?, etc.). Therefore, multiple whitepapers have been prepared by the consortium to summarize the main outcomes of the ProTego project. Besides dissemination to the general public (most notably technically-oriented people), the whitepapers can also support the exploitation strategy of various ProTego assets. More details on this in Deliverable D8.6.

In total, 6 whitepapers have been prepared in the ProTego project:

- ProTego Cybersecurity Educational Framework for healthcare organizations
- Creating a SIEM with the Elastic Stack or with OpenSearch
- ProTego Cybersecurity Risk Mitigation Tools for Hospital and Care Centers
- ProTego-ACC: Access control and key management for healthcare systems
- Continuous authentication ("*Autenticación Continua*")
- The ProTego Integration Toolkit – A Kubernetes Journey

All these whitepapers can be publicly downloaded from the ProTego website:

https://protego-project.eu/white-papers/

As mentioned before in this deliverable, the project website will be online for at least 1 year after the end of the project. To ensure that the whitepapers are accessible also after that date, they also have been uploaded to the ProTego Zenodo repository:

https://zenodo.org/communities/protego/

V. Press releases and posts

Below, we discuss the communication activities in the categories of press releases and online and social media posts. The latter include respectively (1) articles posted on the project website (i.e. blog posts), and (2) posts on social media.

V.1. Press releases

At the start of the project, ProTego has launched several press releases to announce the start of the project and create awareness to the protocol of cybersecurity in healthcare. More details on these press releases can be found in Deliverable D8.3. The remaining 3 press releases are now scheduled towards the end of the project to disseminate the project results. One of these has already been published in AEC press, the two remaining ones are scheduled for beginning of 2022. Below we briefly summarize the published and scheduled press releases for the third project year and beyond:

- AEC press: “Recta final de ProTego, proyecto europeo de ciberseguridad en el ámbito sanitario, con Inetum como socio tecnológico”

  https://aecconsultoras.com/noticia-nota-de-prensa-asociados/recta-final-de-protego-proyecto-europeo-de-ciberseguridad-en-el-ambito-sanitario-con-inetum-como-socio-tecnologico/?utm_source=boletin&utm_medium=email&utm_campaign=boletin_2021-11-22&utm_content=link-recta-final-de-protego-proyecto-europeo-de-ciberseguridad-en-el-ambito-sanitario-con-inetum-como-socio-tecnologico

- Digital newspaper of the UAH: “La UAH trabaja un proyecto de ciberseguridad sanitaria”. This press releases was published in the digital newspaper of the University of Alcalá. The link to this digital newspaper is: https://portalcomunicacion.uah.es/

  The link to the press release is:

  https://portalcomunicacion.uah.es/diario-digital/reportaje/la-uah-trabaja-un-proyecto-de-ciberseguridad-sanitaria.html

  This press release was published on 20/12/2021. On the day of the press release, the article has already been posted on the front page of the website of the University of Alcalá.

- Press releases published on the digital newspaper of UAH are typically picked up by (local) press. Therefore, it can be expected that one or more (local) newspapers will write an article related to the press release mentioned above, i.e., providing an overview of the ProTego project and the research contributions of UAH within the project. However, at this moment (December 2021), it is difficult to estimate how many of these press releases will be published and when exactly. Therefore, we currently estimate that 1 press release will be published based on the article in the digital newspaper of UAH.

The total number of press releases in the ProTego project, including the 3 mentioned above, is 10 (= 9 press releases already published during the first 35 months of the project, and 1 press release in the pipeline for 2022).

V.2. Montly Blog

The consortium partners of the ProTego project have committed themselves to publish at least one blog post per 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. By default, each monthly blog post is posted on the project website.

https://protego-project.eu/blog/

Note that if a blog post has been published on an external website (e.g. medium.com), only the link to this blog post is added to the ProTego website.

In the second project year, 10 monthly blog posts have been produced, and 2 monthly blog posts have been delayed. One of these delayed blog posts has now been published in October 2021, and the other one in December 2021. In the third project year, there were no delays in publishing new blog posts, all planned 12 blog posts have been released on time. As a result, the total number of blog posts on the ProTego website is currently 35. Adding the blog post scheduled for the end of December 2021 will bring the counter to a total of 36 blog posts, i.e. corresponding to exactly an average of 1 blog post per month.

Below one can find an overview of the blog posts from December 2020 to mid December 2021.

N°	Publication date	Title of blog post
1	December 2020	Hybrid Cloud or how to expand limits in healthcare provisioning
2	January 2021	The importance of good password hygiene
3	February 2021	Using Istio Service Mesh to Manage and Secure Microservices
4	March 2021	Return on investment – ROI
5	April 2021	Network Slicing in E-health Networks
6	May 2021	Who CANNOT access the EHRs in Healthcare Information Systems?
7	June 2021	Security by design in non-connected devices
8	July 2021	The role of IT staff in the procurement of medical devices
9	August 2021	Cyber Security Risk Modelling
10	September 2021	ProTego Advanced Research – Policy-driven data protection
11	October 2021	Kubernetes Storage: From Persistent Volumes to NFS to Native Storage
12	October 2021 (delayed post from March 2020)	Apache Parquet for HL7 FHIR
13	November 2021	Goodbye Passwords, long live new auth methods!
14	December 2021 (delayed post from October 2020)	Multi-level security access control and delegation in the healthcare system

Table 1. Overview of monthly blog posts

V.3. Social media posts

The main social media communication channel of ProTego is Twitter. The goal of using Twitter within the ProTego project is twofold. First, it is used to announce short news items – for example a ProTego technical meeting or workshop 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, 51 tweets have been posted on the ProTego Twitter feed from December 2020 until the beginning of December 2021. Among others, these tweets were related to:

- Launch of the Cyber Security Awareness Platform in ProTego
- New blog posts that were posted on the ProTego website.
- New scientific publications of ProTego consortium members
- Human-centric Cyber Hygiene in Healthcare workshop, in collaboration with other H2020 projects
- Synergies with other projects, such as CyberKit4SME, SPHINX, CUREX, etc.
- Parquet Modular Encryption included in Apache Spark

The number of Twitter followers of the ProTego project is currently 72, as can be seen in Figure 13. This is a further, although relatively limited, increase compared to last year.

Figure 13. Screenshot ProTego Twitter

One of the action items from last year was to publish a few LinkedIn posts related to the ProTego project. Most of these are planned at the end of the project. The basic idea is to start from a common text describing the end of the project and its main achievements, and then distribute this text via each of the project partners' LinkedIn network. It is expected that each partner will modify the basic text to highlight the activities that (s)he has been most active in. These LinkedIn posts are scheduled to be published at the end of 2021 or beginning of 2022, so most of these are not published yet at this moment. Moreover, when the ProTego project video will be ready, it will be

– among others- distributed via LinkedIn. Since these LinkedIn posts are only in the pipeline, we will not discuss these further.

There are currently five LinkedIn posts that have already been published. These are respectively:

- https://www.linkedin.com/feed/update/urn:li:activity:6861201383044075520/
- https://www.linkedin.com/posts/inetum_protego-ciberseguridad-horizonte2020-activity-6869316661715992576-IVyz
- https://www.linkedin.com/posts/antonio-jes%C3%BAs-gamito-gonz%C3%A1lez-09462624_cyber-security-awareness-program-activity-6878753265102704640-ZJaW
- https://www.linkedin.com/posts/carlos-cilleruelo_cyber-security-awareness-program-activity-6878978910671912960-zKd7
- https://www.linkedin.com/pulse/closing-month-protego-project-dave-singelee

As can be seen, the first post is related to the 5th plenary project meeting that was organised in Seville in October 2021. The second post is related to the start of the last month of the project. All the other posts are related to the end of the ProTego project.

VI. Organisation of Workshops

VI.1. Workshop on Human-Centric Cyber Hygiene in Healthcare

On the 15th of April, the ProTego project jointly organised a workshop on human-centric cyber hygiene in healthcare together with other Horizon 2020 projects that are active in the same call. These other projects are CUREX, PANACEA, ASCLEPIOS, and SPHINX. The website of the workshop is as follows:

https://curex-project.eu/content/online-workshop-human-centric-cyber-hygiene-healthcare

The workshop organisers were:

- Dr. Christos Laoudias (KIOS Center of Excellence, University of Cyprus, Cyprus)
- Dr. Manos Panaousis (University of Greenwich, UK)
- Dr. Lynne Coventry (University of Northumbria, UK)
- Dr. Dave Singelée (University of Leuven, Belgium)
- Dr. Sotiris Koussouris (Suite 5, Cyprus)
- Vasileios Voulgarakis (ViLabs, Greece-Cyprus)

From this list, Dr. Dave Singelée represented the ProTego project.

The focus of the workshop was on the human aspects related to raising the cybersecurity and data privacy awareness of the workforce in the healthcare sector, a topic that is also covered within the ProTego project.

Due to the COVID19 pandemic, the workshop had to be organised online via zoom. A screenshot made during the workshop can be found below.

Figure 14. Screenshot made during human-centric cyber hygiene in healthcare workshop

Experts from the contributing H2020 projects presented real-life results and lessons learned from healthcare end-users in the context of their EU-funded research. The agenda of the workshop was as follows:

14:00 – 14:10 **Welcome**
Prof. Christos Xenakis (University of Piraeus, Greece)

14:10 – 14:30 **A survey-based risk assessment methodology for improving Cyber Hygiene**
Dr. Elina Argyridou (KIOS Center of Excellence, University of Cyprus, Cyprus)

14:30 – 14:50 **A holistic approach to cybersecurity behaviours**
Dr. Lynne Coventry (University of Northumbria, UK)

14:50 – 15:10 **End-user understanding of their cyber-hygiene responsibilities: a cross-sectional perspective**
Dr. John Brian Pickering (University of Southampton, UK)

15:10 – 15:30 **Cyber-Hygiene: Concerns and Way-Outs for Healthcare Stakeholders**
Prof. Thomas Penzel (Interdisciplinary Sleep Medicine Center, Charité-Universitätsmedizin Berlin, Germany)

15:30 – 15:45 **Break**

15:45 – 16:05 **Cybersecurity awareness at SPHINX pilot sites**
Athanasios Tzikas (University General Hospital of Larissa, Greece)

16:05 – 16:20 **Standardisation Activities in CUREX H2020 project**
Irene-Maria Tabakis (Cyberlens, Netherlands)

16:20 – 17:00 **Panel Discussion**
Moderator: Prof. Christos Xenakis (University of Piraeus, Greece)

- Dr. Panos Papachristou (Karolinska Institutet, Sweden)
- Dr. Lynne Coventry (University of Northumbria, UK)
- Prof. Salvador Garcia (Marina Salud Hospital, Spain)
- Dr. Nicolae Paladi (Research Institutes of Sweden)
- Dr. Christos Ntanos (National Technical University Of Athens, Greece)
- Dr. Diana Navarro Llobet (Fundació Privada Hospital Asil de Granollers, Spain)

The peak attendance during the workshop reached 76 participants, where 37.50% had academic/research background, 12.50% were healthcare professionals, 15.63% came from the industry, 3.13% were policy makers and 31.25% had another background.

One of the key takeaway messages that came up during the workshop and especially the panel discussion is that time is the biggest challenge that healthcare organisations face when attempting to address human centric cyber hygiene requirements. That is, it is hard for healthcare professionals to adopt cybersecurity and data privacy best practices and allocate time for awareness raising and training activities to improve their skills, especially during stressful periods like with the ongoing Covid-19 pandemic. This is in line with what the attendees answered to a poll question before the panel discussion, i.e., 50% think that the biggest challenge for healthcare organisations is the integration with existing policies and procedures, 38% is the willingness of the staff to align with training and awareness recommendations, 44% is the available budget for IT based cyber security controls, and 13% is the available budget for training activities.[2]

[2] https://curex-project.eu/content/human-centric-cyber-hygiene-healthcare-workshop

VII. Active participation in workshops

During the third year of the project, the consortium partners actively participated to 6 workshops that were relevant for the ProTego project. At these events, results and concepts of the ProTego project were presented to the other participants. The details of these activities are given below (in chronological order).

1. **Human-Centric Cyber Hygiene in Healthcare workshop**
    - Date and Location: 15/04/2021, online
    - Title of presentation:
        i. End-user understanding of their cyber-hygiene responsibilities: a cross-sectional perspective
        ii. Participation in panel discussion
    - URL: https://curex-project.eu/content/online-workshop-human-centric-cyber-hygiene-healthcare
    - Context: As discussed in the previous section, ProTego co-organized a workshop on human-centric cyber hygiene in healthcare jointly with other Horizon 2020 projects active in the same call as ProTego. During this workshop, Brian Pickering from IT Innovation gave a presentation on the end-user understanding of their cyber-hygiene responsibilities. Moreover, Salvador Garcia from Marina Salud participated in the panel discussion to give the hospital's point of view on cyber hygiene in healthcare.
2. **18th Security and Health Data Protection Forum (Sociedad Española de Informática de la Salud - SEIS)**
    - Date and Location: 19/05/2021, Oviedo, Spain
    - Title of presentation: Visibilidad y cibercontrol en entornos hospitalarios
    - URL: https://seis.es/wp-content/uploads/2021/05/Programa-Foro-Datos-2021.pdf
    - Context: On the 19th and 20th of May 2021, the 18th edition of the security and health data protection forum was organised. During this event, Inetum gave an overview of the results from WP4 of ProTego.
3. **19th eHealth Network**
    - Date and Location: 03/06/2021, online
    - Title of presentation: ProTego – Data Protection Toolkit: Assessing and Reducing Risks in Hospitals and Care Centers
    - URL: https://ec.europa.eu/health/ehealth/policy/network_en
    - Context: On the 3rd and 4th of June 2021, the 19th edition of the e-health network was organised. During the plenary session, Luis Carrascal from Inetum presented the ProTego project.
4. **SYSTOR 2021**
    - Date and Location: 16/06/2021, online
    - Title of presentation: Secure store for FHIR resources with Parquet Encryption
    - URL: https://www.systor.org/2021/posters.html
    - Context: IBM presented a poster on Parquet Modular Encryption (results of WP5 within the ProTego project) during the SYSTOR conference.

5. **Mobile Week**
    - Date and Location: 18/10/2021, Alcalá de Henares, Spain
    - Title of presentation: La vulnerabilidad de una sanidad hiperconectada
    - URL: https://mobileweekalcala.com/protecciones-relaciones/
    - Context: Carlos Cilleruelo, a researcher from Universidad de Alcalá de Henares, gave a talk about the cybersecurity challenges that healthcare infrastructures face once all their devices are interconnected, and how the work in ProTego addresses this challenge.
6. **Health Knowledge Forum**
    - Date and Location: 18/10/2021, Alcalá de Henares, Spain
    - Title of presentation: ProTego project
    - URL: https://mobileweekalcala.com/foro-conocimiento/
    - Context: At this industry forum and networking event, the ProTego had a stand. ProTego posters have been displayed at this stand and flyers have been distributed to the participants.

VIII. Project showcases and videos

VIII.1. Educational video

Within the framework of WP3, 4 ProTego videos have been produced and posted on the Cyber Security Awareness Platform website:

https://protego-project.eu/cybersecurity/

These easy to consult educational videos posted on the ProTego website aim to improve the cyber security awareness inside the healthcare organizations. We refer to deliverable D3.3 for a detailed discussion on the content of these educational videos. Instead, we only summarize the topics of the 4 educational videos on the ProTego platform:

- The good employee: general cybersecurity-related topics that hospital employees could face during their normal job activities
- Safe passwords: how to perform good password management
- Social engineering: create awareness on the topic of social engineering, including phishing attacks, and how to protect against this risk
- Mobile devices: recommendations on how (not) to use personal devices within the context of healthcare.

All these 4 educational videos are publicly available to the general public via the ProTego awareness platform.

VIII.2. General ProTego video

Due to the ongoing COVID19 pandemic, it was not possible to organise a physical closing workshop of the ProTego project. The alternative solution would be to have a virtual (i.e, online) workshop. However, after having evaluated this option, it has been discarded due to the limited benefits it would offer. Therefore, instead of organising a virtual workshop, the ProTego consortium has decided to make a general video on the ProTego project. This will be a relatively short video that will discuss the following points:

- Why do hospitals need the cybersecurity solutions that have been developed in ProTego (including interviews with the hospitals).
- Summary of the main outcomes of the project
- General information about the ProTego project

The preparations for this video have already started, but the actual recording of the video will only take place in January 2022.

The ProTego consortium plans to use this video for the following purposes:

- As additional material in social media posts that will be launched at the end of the project.
- The video will be put on the project website, so that people can watch the video instead of reading the project summary.
- The video will support the information campaigns that are needed for the exploitation of the individual exploitable assets (see also deliverable D8.6).
- Each of the consortium members can use the video in their individual communication and dissemination activities after the project. For example, it can be shown to potential customers.
- The European Commission can use the general ProTego video to advertise the research made within the call H2020-SU-TDS-02-2018, and the results of the ProTego project specifically.

Given the multitude of potential uses of this video, the benefits of having this project video clearly outweigh the extra effort that will be required in the beginning of 2022 to record and produce the video.

IX. SYNERGIES WITH OTHER PROJECTS

One of the additional dissemination targets that have been set in the revised dissemination plan (see D8.5), is to actively explore synergies with other Horizon 2020 projects. This activity has already started in 2020, by reaching out to the CUREX project in the context of the ProTego workshop on 'Data Protection for Health Care'. In 2021, two dissemination events have taken place where multiple Horizon 2020 projects jointly contributed to:

- Joint workshop on human-centric cyber hygiene in healthcare. This was jointly organised by ProTego, CUREX, PANACEA, ASCLEPIOS, and SPHINX. More information on this workshop can be found in section VI of this deliverable.
- A second event is the 19th e-health network. During this networking event, the following projects have presented themselves: ProTego, CUREX, PANACEA and SPHINX. More information on this event can be found in section VII of this deliverable.

Besides these two dissemination events, the ProTego project also actively engaged to two other projects:

- A new cross-project collaborative journey with the CyberKit4SME has been started. The goal of this H2020 project is to help SMEs and MEs analyse, forecast and manage cyber security and data protection risks. More information can be found on https://cyberkit4sme.eu/

  The idea of the collaboration is to ensure that the research outcomes of the ProTego project can be incorporated in the CyberKit4SME, so that the SMEs and MEs targeted in this project can use the tools developed in ProTego. More information on the collaboration between CyberKit4SME and ProTego can be found on the following website:

  https://cyberkit4sme.eu/collaboration-h2020/

- The ProTego project also started discussions with the ODIN project. This is a new H2020 project that recently started. ODIN is a European multi-centre pilot study focused on the enhancement of hospital safety, productivity and quality. More information on this project can be found on

  https://odin-smarthospitals.eu/

  During discussions between both consortia, the ProTego project agreed to participate in a webinar that will be organised for the consortium member of the ODIN project. In this project, researchers from ProTego will explain their main results, so that researchers within the ODIN project can leverage upon that. Initially, this webinar was scheduled in the Fall of 2021. However, the ODIN project has requested to postpone the webinar to 2022. The exact date still has to be decided, but most likely it will be in April 2022, in combination with the Privacy Symposium organised in Venice (5th-7th of April 2022). Despite that this date is after the end of the ProTego project, the consortium commits itself to still contribute to the webinar, as it brings added value to the dissemination actions of ProTego.

X. 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.

Several actions have been taken by ProTego in 2021 towards supporting the open access policy.

All public research reports and deliverables are made available to the public via the project website of ProTego. Many conferences and journals have at least green open access, meaning that self-archiving is allowed. Therefore, all published articles and papers will be publicly accessible. More specifically, the ProTego project uses an Open Access repository to publish all its research articles. A repository on Zenodo has been created for the ProTego project:

https://zenodo.org/communities/protego/

This Zenodo repository further improves the visibility of the ProTego project, and ensures that the research articles are as widely accessible as possible. By default, each new publication is added to the Zenodo repository. This Zenodo repository will be managed in 2022 as well, to ensure that all scientific articles which are currently being reviewed and only accepted in 2022, will appear in the repository.

XI. 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 third project year (excluding the second half of December 2021). These activities included:

- Maintenance of a public project website
- Release of an additional website (ProTego Cyber Security Awareness Platform)
- Dissemination of the project through scientific research papers
- Publication of whitepapers on the project website
- Press releases
- Social media and monthly blog posts
- Organisation of a joint workshop with other H2020 projects
- Active participation in conferences, workshops and events
- Release of project videos
- Preparation of a general project video that will be recorded beginning of 2022
- Exploration of synergies with other H2020 projects

The main dissemination channel is the project website, which contains all the project information. To ensure that information about the ProTego project remains accessible, the ProTego consortium commits themselves to keep the project website online for at least 1 year after the end of the project (and with the possibility to further extend this period when needed).

When combining the website statistics of the main ProTego website and the Cyber Security Awareness Platform – statistics of both websites are based on Google Analytics – one can observe a further increase in visitors and page views. More specifically, the total number of users visiting one of the websites has increased with 50%, while the total number of page views has increased with 25%. The Cyber Security Awareness Platform accounts for 50% of the total visits to ProTego. On the main website, the most popular items are the ProTego deliverables, publications, and particularly the monthly blog posts.

One workshop was jointly organised with 4 other H2020 projects. The topic of the workshop was human-centric cyber hygiene in healthcare, and all projects contributed with one or more speakers and panellists. Moreover, synergies and collaborations with other H2020 projects have been explored and set up, even beyond the timeline of the ProTego project.

At the end of month 35 of the project, 22 scientific publications have been accepted and published, 6 publications are currently under peer-review, and 2 scientific publications are still being prepared for submission with the next 1-2 months.

Table 4 below shows the dissemination status with respect to the revised KPIs. As can be seen in this table, all dissemination targets have already been reached, or will be reached in the near future taking into account the activities in the pipeline (denoted by * in the table). For some of the dissemination goals, the final number of activities even exceeds the initial target value. The only exception is the number of events and workshops organised by ProTego. Instead of organising a final closing workshop, it has been decided to replace this by a general project video that will be disseminated via various communication channels.

Therefore, in conclusion, the ProTego project achieved all its dissemination targets.

Table 2. Status dissemination targets on 1st of December 2021 (M35 of the project)

Dissemination channel	Result	Target
Scientific publications	22+6*	At least 20 publications
White papers	6	At least 4
Participation in events	21	At least 20 events
Organization of scientific events or seminars	6	At least 7
Press releases	9+1*	At least 10
Project showcases and videos	4+1*	At least 2
Monthly blog posts	35+1* blog posts	On average, at least 1 per month
Social media posts	51 Tweets 5+6* LinkedIn posts	At least 30 Tweets and 5 LinkedIn posts in 2021
Explore synergies with other projects	3+1*	At least 2 projects in 2021


ProTego