



D2.7 Cybersecurity Projects Radar Final Report Spring 2021

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Abstract:

We present in this report a series of visualisations of EC supported activities in the area of Cybersecurity and Privacy that allows possible exploiters of the outputs of these projects to understand their status.



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Executive Summary

The European Commission has launched 117 calls which were either explicitly supporting projects in the domain of Cybersecurity and Privacy (CS & P), or from which projects in this area were supported. As such through this and previous reports in this series we consider what the outputs of these projects have been and where the products they have created have gone in terms of exploitation either by the projects themselves or by others who may reuse their outputs.

The previous deliverable, D2.5 Technology Radar 2nd report – Spring 2020¹ was able to show the development of the landscape since the radar was established for Autumn 2018, utilising the established methodology from D2.2, the 1st radar report².

Since then, we have of course had the COVID-19 pandemic which has caused significant disruption. We have only seen the number of projects and calls available for analysis in the radar increase by two, though this is still a significant dataset.

Of most significance from our analysis is the decline in the number of projects that are displayed on the radar. This, Spring 2021 edition has seen a year on year drop of 46 projects with 34 projects leaving in the last six months. This has left several areas of the radar significantly under populated, most particularly the two areas of human or social interactions with cyber security, Human Aspects now having only two running projects. Overall though it's clear that the landscape is shrinking in terms of funded projects though it is not clear as we emerge from the pandemic how we will assess future projects in the domain and enter them into the radar and hub.

The Spring 2021 Projects Radar continues to present a strong imbalance across the radar sectors. In the last fixed edition of the radar (Autumn 2020³) the Secure Systems sector was overrepresented with an ~50% share. This has continued even in the shrinking landscape though slightly decreased with now a 45% share. The radar edition covered by this report is the first active or Live edition, where the data is no longer fixed but dynamic, with the timing of movements between rings dependent on the project start and end dates and the date when the visualisation is done. A key new capability is also the addition of the JRC Taxonomy to tag projects and filter the dataset to establish the ability to answer questions on specific capabilities or project foci. This allows us to provide a segmentation previously not available which is unique. Overall the projects radar has reached a level of usefulness for a large number of different relevant stakeholders.

Bearing in mind the drop in population of funded actions overall and the recent release of new Horizon Europe Cybersecurity funding calls that concentrate on the technology of cybersecurity it is essential that future calls are released that concentrate on the human aspects of cybersecurity. These may either be directly targeting the user of differing ICT technologies, or through policy focused action but it is clear that we cannot technology our way out of cybersecurity vulnerabilities but instead have to ensure that the 'user' is involved and engaged throughout. Alongside this recommendation on funding it is important that there is the continued push by the commission to ensure that funded projects engage with the radar and the cyberwatching Hub⁴ such that the view of the ecosystem continues to be up to date and useful to the range of stakeholders that are now utilising the radar.

¹ <https://www.cyberwatching.eu/d25-cybersecurity-technology-radar-2nd-report>

² <https://www.cyberwatching.eu/d22-cybersecurity-technology-radar-1st-report-autumn-2018>

³ <https://radar.cyberwatching.eu/radar/autumn-2020>

⁴ <https://www.cyberwatching.eu/projects>

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1 Introduction

Since the previous technology Radar report [1] we have had a significant period of global disruption due to the COVID pandemic. As such, we should therefore not be surprised to see some transitions between then and now that are less favourable than those we have seen previously, for example the steady growth of projects in the domain that are assessed for inclusion and presentation through the cyberwatching.eu Hub and more generally that are presentable within the radar itself. We have as with the previous reports, kept the methodology of assessing projects (refer to [1] for an in-depth explanation of the methodology), neither has the intent and purpose of the radar. The change that has occurred is the sample⁵ of EU funded projects within the EU Cybersecurity and Privacy (CS & P) landscape. Due to the disruption that has occurred the patterns that emerge, whilst being interesting and noteworthy, may not all be positive. We are though able to show clear patterns of project development over their lifetime, as described in this deliverable.

It is important to once again reiterate as we did in the previous Radar Report that the Projects Radars do *not* visualise the entire data set: Each Radar includes only those projects that were either active or finished within 3 years of the radar's reference date. Any project that has not started by then, or is older than 3 years, is not included. Hence, Projects Radars represent *sliding windows* into the history of the EU's investment strategy in CS & P research.

Since the publication in [1] the five previous radar editions (Autumn 2018, Spring & Autumn 2019, and Spring & Autumn 2020) are available online in a first version prominently placed on the cyberwatching.eu website [2]. These editions of the radar are static snapshots of their time and as such we have since then introduced a new version of the radar, a third version, which operates as a live version of the radar, with analysis of project related input data performed live at point of display. As such the only downside is that the output of the radar is ever more of a snapshot at the point of the viewers interaction with it. As such we warn on the radar page itself of this feature in that the resource is now uncitable unless a static snapshot has been taken. Therefore, within the report the Spring 2021 edition is as per a set of visualisations captured from the radar on 31st May 2021.

Additional features of this edition of the radar will also be discussed in terms of active filtering and visualisation based not only on the cyberwatching.eu taxonomy but also that from the JRC. As such the radar is now a tool that may actively present sections of the funded project landscape identified utilising multiple taxonomies and segmented however the consumer of the output requires.

This edition of the cyberwatching.eu Projects Radar will provide an analysis of the data available across all previous editions, spanning more than two and a half years of data gathering and analysis

⁵ Statistically speaking the Cyberwatching.eu project will only ever operate on samples of a data set, not a complete population of projects.

Glossary of Terms

| Term | Description |
|-------------------|---|
| CI | Critical Infrastructure(s) |
| CS & P | Cybersecurity and Privacy |
| H2020 | Horizon 2020 |
| IA | Innovation Action |
| JRC | Joint Research Centre |
| MTRL | Market and Technology Readiness Level. Individual TRL and MRL (Market Readiness Level) scores conjoined into one data value, frequently noted as (MRL, TRL) |
| Projects Radar | Short term for Cyberwatching.eu CS & P Projects Radar |
| RIA | Research and Innovation Action |

2 The analysed projects

In line with the process established in the first edition of the report [1] we collected projects from a total of 117 funding calls (Spring 2021; only increasing by 2 from Spring 2020). These calls are, in alphabetical order:

| | | |
|---------------------------|---------------------------|------------------------------|
| CIP-01-2016-2017 | H2020-EU.3.7.4 | JTI-CS2-2018-CfP09-SYS-01-11 |
| DRS-17-2014 | H2020-FOF-2016 | MSCA-COFUND-2016 |
| DS-01-2014 | H2020-ICT-2014-1 | MSCA-IF-2014-EF |
| DS-01-2016 | H2020-ICT-2015 | MSCA-IF-2015-EF |
| DS-02-2014 | H2020-ICT-2016-1 | MSCA-IF-2016 |
| DS-02-2016 | H2020-ICT-2017-1 | MSCA-IF-2017 |
| DS-02-2016 | H2020-ICT-2019-2 | MSCA-IF-2018 |
| DS-03-2015 | H2020-INFRAEOSC-2018-1 | MSCA-ITN-2014-ETN |
| DS-03-2016 | H2020-IOT-2016 | MSCA-ITN-2015-ETN |
| DS-04-2015 | H2020-IOT-2017 | MSCA-RISE-2015 |
| DS-04-2016 | H2020-MSCA-RISE-2015 | MSCA-RISE-2016 |
| DS-05-2015 | H2020-MSCA-RISE-2017 | MSCA-RISE-2018 |
| DS-05-2016 | H2020-SC1-FA-DTS-2018-1 | MSCA-RISE-2019 |
| DS-06-2014 | H2020-SMEINST-1-2016-2017 | PEOPLE-2007-4-3.IRG |
| DS-07-2015 | H2020-SU-DS-2018 | S2R-OC-IP2-01-2015 |
| DT-ICT-02-2018 | H2020-SU-ICT-2018 | SEC-2010.6.5-2 |
| ECSEL-2016-2-IA-two-stage | H2020-SU-ICT-2018-2 | SEC-2011.2.5-1 |
| ECSEL-2017-2 | ICT-01-2019 | SEC-2011.3.4-1 |
| EE-13-2014 | ICT-06-2016 | SEC-2011.6.1-5 |
| EIC-SMEInst-2018-2020 | ICT-07-2014 | SEC-2011.6.5-2 |
| EINFRA-22-2016 | ICT-09-2014 | SEC-2012.2.3-1 |
| ERC-2013-SyG | ICT-10-2016 | SEC-2012.6.1-2 |
| ERC-2018-COG | ICT-12-2015 | SiS-2008-1.2.2.1 |
| ERC-AG-PE6 | ICT-12-2016 | SiS-2009-1.1.2.1 |
| ERC-CG-2013-PE6 | ICT-16-2015 | SiS.2013.1.2-1 |
| ERC-CoG-2014 | ICT-18-2016 | SMEInst-01-2016-2017 |
| ERC-SG-PE6 | ICT-20-2019-2020 | SMEInst-02-2016-2017 |
| EUB-1-2015 | ICT-2007.1.4 | SMEInst-09-2016-2017 |
| FCT-09-2015 | ICT-2007.6.2 | SMEInst-10-2016-2017 |
| FP7-ICT-2013-10 | ICT-2009.1.4 | SMEInst-13-2016-2017 |
| FP7-PEOPLE-2011-IOF | ICT-2013.1.5 | SSH-2009-3.2.1. |
| FP7-PEOPLE-2012-CIG | ICT-2013.10.1 | SU-DS01-2018 |
| FP7-PEOPLE-2013-CIG | ICT-2013.6.1 | SU-DS04-2018-2020 |
| FP7-PEOPLE-2013-IIF | ICT-32-2014 | SU-DS05-2018-2019 |
| FP7-PEOPLE-IOF-2008 | ICT-35-2016 | SU-FCT02-2018-2019-2020 |
| FP7-SEC-2012-1 | ICT-37-2014-1 | SU-ICT-01-2018 |
| H2020-DS-LEIT-2017 | ICT-37-2015-1 | SU-INFRA01-2018-2019-2020 |
| H2020-DS-SC7-2016 | ICT-38-2015 | SU-TDS-02-2018 |
| H2020-DS-SC7-2017 | INNOSUP-02-2016 | SU-TDS-03-2018 |

Table 1: List of EC funding calls for projects included in the Projects Radar database

The Cyberwatching.eu R&I Project Hub now includes a total number of 263 projects of which 34 are considered out of scope of the radar, in line with the criteria set out in [1]. These projects are:

| | | |
|------------------|------------|--------------------|
| 3ants | DSSC | PRIPARE |
| CAPITAL | ECRYPT-NET | PROOFY |
| CE-IoT | FAR-EDGE | ReCRED |
| CloudTeam | FIDELITY | RPS |
| COLA | FORTIKA | SAFETY 4.0 |
| CREATE-IoT | IPaCSO | SamurAI |
| CROSSMINER | LIMPET | SecureHospitals.eu |
| cyberwatching.eu | MELODIC | SOFIE |
| CYBERWISER.EU | OCRE | STAMP |
| DECODE | OPENREQ | SWITCH |
| DITAS | P5 | TRUESSEC.EU |
| DOGANA II | | |

Table 2: Projects considered out of scope for the Projects Radar

Appendix 1 provides a complete list of projects included in the Project Hub.

3 The Live Projects Radar as Presented Spring 2021

This final edition of the Projects Radar report includes two analyses, an analysis of both the most recent snapshot of information as presented in the new Live version of the Radar as taken as snapshot for May 31st 2021, as well as an analysis of trends across the now six available Radar editions since the first report [1] was published.

Reusing the same structure, we present an analysis sector by sector, followed by analysing the full radar history from Autumn 2018 to Spring 2021. This deliverable will not list the detailed tabulations of projects, or the visualisation of the radar editions, as these are available online at <https://www.cyberwatching.eu/technology-radar>.

It should be noted once again with the most recent edition of the Radar, the Live version, that this is a constantly evolving version of the radar. As such visualisation taken on different days, even reasonably close together can be different and therefore for consistency if views are taken for external analysis the date and time of the radar snapshot used should be clearly described.

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 34 | 17 | 9 | 40 | 34 | 134 |
| Spring 2019 | 69 | 15 | 32 | 48 | 11 | 175 |
| Autumn 2019 | 67 | 22 | 34 | 52 | 16 | 191 |
| Spring 2020 | 63 | 9 | 38 | 32 | 48 | 190 |
| Autumn 2020 | 42 | 23 | 29 | 34 | 50 | 178 |
| Spring 2021 (Live May 31 st 2021) | 32 | 13 | 29 | 35 | 35 | 144 |

Table 3: Breakdown of projects by editions and lifecycle stages

3.1 Results by sector

3.1.1 Secure Systems and Technology

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 12 | 7 | 3 | 17 | 8 | 47 |
| Spring 2019 | 25 | 7 | 16 | 23 | 9 | 80 |
| Autumn 2019 | 31 | 7 | 17 | 24 | 10 | 89 |
| Spring 2020 | 30 | 3 | 15 | 16 | 23 | 87 |
| Autumn 2020 | 22 | 9 | 10 | 17 | 23 | 81 |
| Spring 2021 (Live May 31 st 2021) | 16 | 6 | 12 | 14 | 17 | 65 |

Table 4: "Secure Systems and Technology" overview – Spring 2021 (Live May 31st 2021)

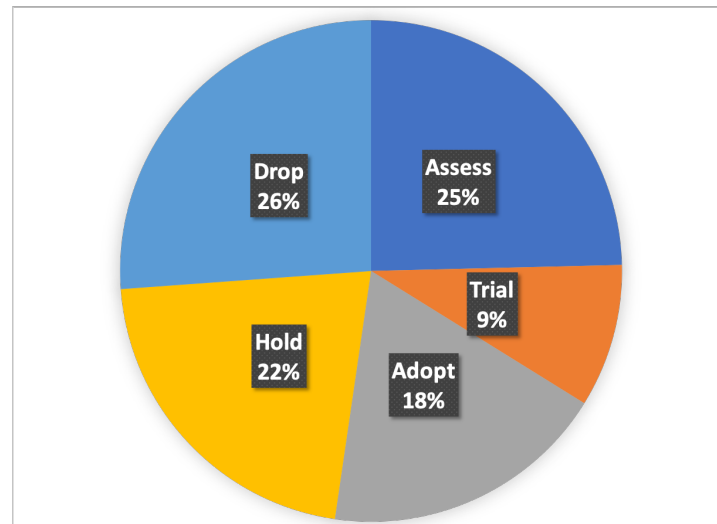


Figure 1: Distribution of projects by lifecycle stage in the “Secure Systems and Technology” sector – Spring 2021, (live snapshot May 31st 2021)

“Secure systems and technology” is still understandably the most popular area within the cybersecurity and privacy ecosystem, being what most would consider the front line in protecting resources, developing new technological solutions to what can be a technology driven problem.

We had previously noted that the initial jump on projects since Autumn 2018 is very atypical, given that 2018 sits well within the H2020 funding cycle. In our analysis we concluded that this is a consequence of our initial dataset being far too incomplete, which was then rectified with the second wave of data gathering of funded projects in the EU CS & P landscape.

Having said that, the continuous high level of projects in the pipeline (Assess ring) over the Radar editions is a reassuring sign of continued demonstration and perceived importance of research and innovation towards secure systems in an increasingly digital world.

When we look at the final two editions though it is clear that we are seeing a decline in the number of awarded projects represented within the radar. The decline is noticeable across all rings with similar numbers of projects still in assess as in Drop. The previously clear waves of projects have now dissipated and of the projects that now feature in the radar we are at the tail end of the most recent wave, with over 50% of the projects shown within the sector now ended.

There are now 12 projects in the Adopt ring of which all but two have now completed MTRL assessments. From those as shown in Table 4 the majority of projects in the Adopt state are RIA projects though the majority of those have negative Performance scores, i.e. they have a lower MTRL score than the median within the sector, in some cases significantly less. In the majority of the cases though the score that is lagging from TRL and MRL is the MRL, i.e. the projects are not yet in a position where they could truly say they are ready to launch products into the wider ecosystem.

| # | Project | Type | TRL | MRL | Performance |
|-----|---------------|----------|-----|-----|-------------|
| 116 | SCOTT | ECSEL-IA | 7 | 6 | 18 |
| 131 | STOP-IT | IA | 9 | 6 | 22 |
| 151 | REACT | RIA | 3 | 3 | -11 |
| 152 | SerIoT | RIA | 6 | 1 | -19 |
| 153 | YAKSHA | RIA | 3 | 2 | -18 |
| 162 | ASTRID | RIA | 3 | 2 | -18 |
| 177 | ENACT | RIA | 3 | 3 | -11 |
| 179 | CYBERWISER.EU | IA | 8 | 7 | 27 |
| 188 | SecureIoT | RIA | 7 | 7 | 25 |
| 239 | InfraStress | IA | 7 | 5 | 11 |

Table 5: Projects addressing "Secure Systems and Technology" close to or ready for adoption

3.1.2 Verification and Assurance

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 2 | 1 | 1 | 4 | 8 | 16 |
| Spring 2019 | 7 | 0 | 2 | 5 | 1 | 15 |
| Autumn 2019 | 6 | 3 | 2 | 4 | 2 | 17 |
| Spring 2020 | 8 | 0 | 3 | 2 | 5 | 18 |
| Autumn 2020 | 4 | 4 | 3 | 2 | 4 | 17 |
| Spring 2021 (Live May 31 st 2021) | 3 | 0 | 3 | 3 | 3 | 12 |

Table 6: "Verification and Assurance" overview – Spring 2021 (Live May 31st 2021)

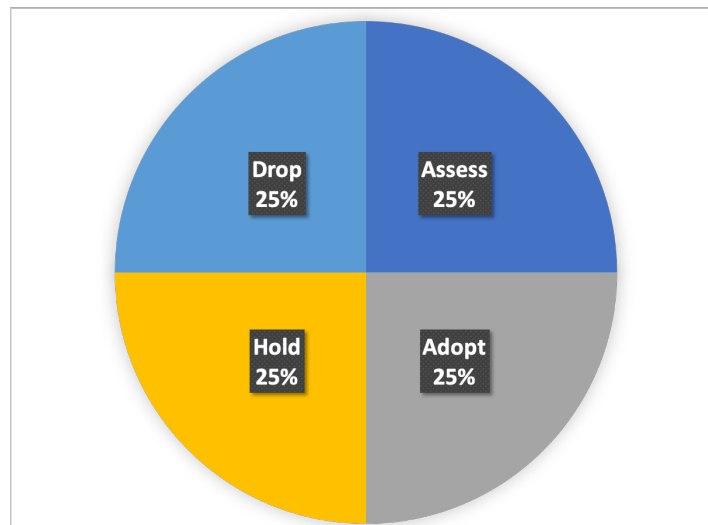


Figure 2: Distribution of projects by lifecycle stage in the "Verification & Assurance" sector – Spring 2021, (Live May 31st 2021)

This is still one of the smallest sectors in Spring 2021, unlike previous editions this sector “Verification and Assurance”, have also seen a decrease in the pipeline of incoming projects. This decrease can though be traced back to the Autumn 2020 radar edition, a feature of it being now though that we have a component in the lifecycle with no projects in it at all. As per the other sectors approximately 50% of all projects represented have now completed.

Judging the success of MTRL assessments, 5 of the remaining projects have completed assessments with the majority now having completed. Of these, the two ready for adoption according to their lifecycle stage are:

| # | Project | Type | TRL | MRL | Performance |
|-----|-----------|---------------|-----|-----|-------------|
| 159 | FutureTPM | RIA | 3 | 2 | -11 |
| 223 | SECREDAS | ECSEL- RIA | 7 | 4 | 11 |

Table 7: Projects addressing "Verification & Assurance " that are close to or ready for adoption

3.1.3 Operational Risk, Management and Analytics

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 6 | 3 | 2 | 6 | 3 | 20 |
| Spring 2019 | 10 | 2 | 7 | 5 | 0 | 24 |
| Autumn 2019 | 12 | 2 | 6 | 7 | 1 | 28 |
| Spring 2020 | 12 | 1 | 4 | 7 | 5 | 29 |
| Autumn 2020 | 8 | 4 | 3 | 4 | 8 | 27 |
| Spring 2021 (Live May 31 st 2021) | 7 | 3 | 4 | 4 | 6 | 24 |

Table 8: “Operational Risk, Management and Analytics” overview – Spring 2021 (Live May 31st 2021)

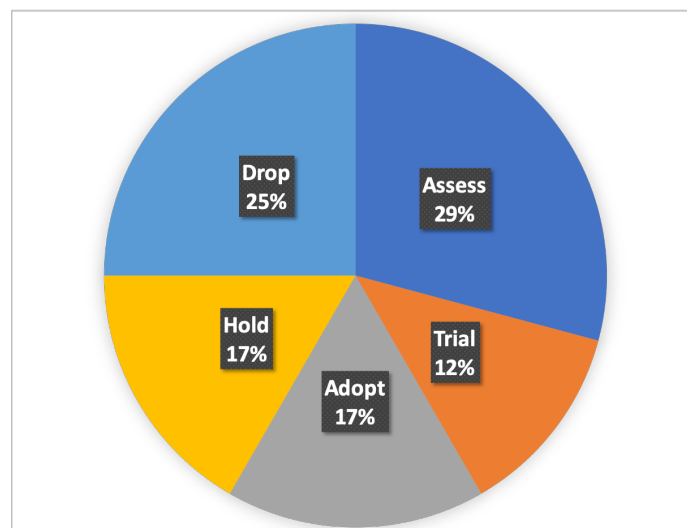


Figure 3: Distribution of projects by lifecycle stage in the “Operational Risk, Management and Analytics” sector – Spring 2021 (Live May 31st 2021)

A pattern similar to that for “Secure Systems and Technology” appears for “Operational Risk, Management and Analytics”. We again attribute this to an insufficient dataset at the time of analysis presented in [1].

The pipeline is starting to empty out though there are a gratifying number of projects whose products and lifecycle are suitable for adoption, with 42% of projects in this sector having completed now.

There are four projects considered ready for adoption, according to their lifecycle stage, in this sector of which 3 have completed MTRL assessments:

| # | Project | Type | TRL | MRL | Performance |
|-----|---------|---------|-----|-----|-------------|
| 52 | IMPACT | ERC-SyG | 1 | 0 | -32 |
| 148 | FENTEC | RIA | 3 | 4 | 0 |
| 222 | RESISTO | IA | 7 | 3 | 1 |

Table 9: Projects addressing " Operational Risk, Management and Analytics " that are close to or ready for adoption

From the assessments of MTRL across the whole sector though it is clear that overall the projects in this sector though temporarily may be ready for adoption are not due to overall low MTRL scores.

3.1.4 Identity, Behaviour, Ethics and Privacy

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 4 | 2 | 1 | 6 | 6 | 19 |
| Spring 2019 | 11 | 2 | 1 | 10 | 0 | 24 |
| Autumn 2019 | 8 | 3 | 2 | 9 | 2 | 24 |
| Spring 2020 | 6 | 2 | 5 | 1 | 10 | 24 |
| Autumn 2020 | 3 | 4 | 5 | 2 | 8 | 22 |
| Spring 2021 (Live May 31 st 2021) | 1 | 2 | 7 | 4 | 2 | 16 |

Table 10: "Identity, Behaviour, Ethics and Privacy" overview - Spring 2021 (Live May 31st 2021)

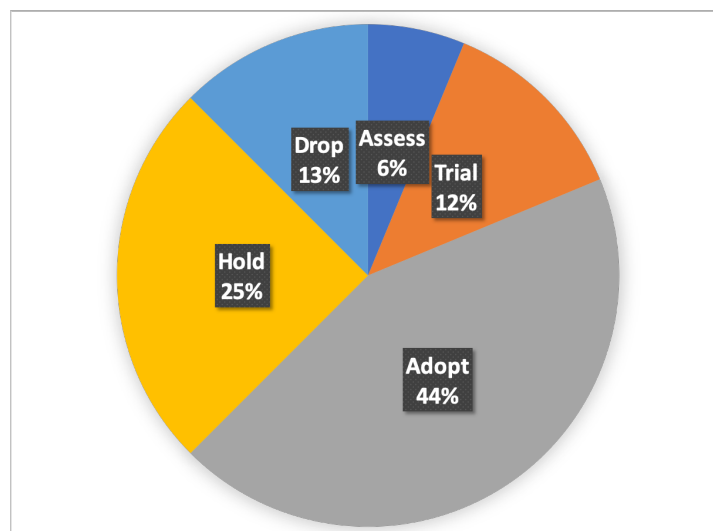


Figure 4: Distribution of projects by lifecycle stage in the "Identity, Ethics, Behaviour and Privacy" sector – Spring 2021 (Live May 31st 2021)

As previously discussed along with other sectors in this Radar, we see a jump in number of projects between the Autumn 2018 and Spring 2019 radar editions. This adds to the evidence of insufficient data for 2018.

When considering the analysis of this sector, “Identity, Behaviour, Ethics and Privacy”, we can see overall that the number of projects is significantly low across all years. Though there are still more than 50% of the projects in this sector being active with the majority of these projects being within the Adopt ring meaning there are also a very low number within Assess (1) and Trial rings. This means that there could be a future shortfall in new products or outputs in this area. This is a worry as social engineering is still a significant and possibly the largest threat and so understanding how people behave in cybersecurity terms, how we can improve the usability of string identity management systems whilst maintaining user privacy should be considered the highest importance.

There are seven projects available for adoption, according to their lifecycle stage, of which six have completed MTRL assessments:

| # | Project | Type | TRL | MRL | Performance |
|-----|-----------|------|-----|-----|-------------|
| 158 | PRIVILEGE | RIA | 6 | 3 | -8.5 |
| 163 | BPR4GDPR | IA | 3 | 4 | -7.5 |
| 164 | PAPAYA | IA | 3 | 5 | -0.5 |
| 165 | POSIEDON | IA | 6 | 5 | 5.5 |
| 168 | DEFEND | IA | 7 | 6 | 14.5 |
| 178 | PDP4E | IA | 7 | 4 | 0.5 |

Table 11: Projects addressing Identity, Ethics, Behaviour and Privacy " that are close to or ready for adoption

3.1.5 National & international Security, Privacy and Governance

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 5 | 4 | 0 | 2 | 1 | 12 |
| Spring 2019 | 10 | 4 | 1 | 2 | 0 | 17 |
| Autumn 2019 | 8 | 2 | 5 | 2 | 0 | 17 |
| Spring 2020 | 6 | 2 | 6 | 1 | 2 | 17 |
| Autumn 2020 | 4 | 2 | 4 | 5 | 2 | 17 |
| Spring 2021 (Live May 31 st 2021) | 5 | 1 | 2 | 5 | 2 | 15 |

Table 12: “National & international Security, Privacy and Governance” overview - Spring 2021 (Live May 31st 2021)

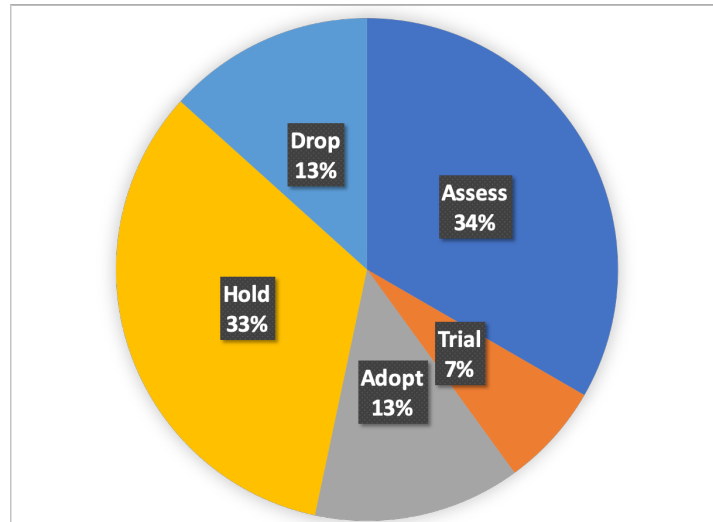


Figure 5: “National & international Security, Privacy and Governance” radar – Spring 2021 (Live May 31st 2021)

Overall in the history of this sector, “National & international Security, Privacy and Governance”, the number of projects has remained remarkably constant with a clear wave of funded projects moving through the stages of project lifecycle. Of particular note is the similarity in distribution between stages for all of the reports, including this one.

There are only two projects whose outputs are adoptable of which only one has completed an MTRL assessment. Also note that the previously noted adoptable project has now moved to Hold status.

| # | Project | Type | TRL | MRL | Performance |
|----|----------|------|-----|-----|-------------|
| 29 | CS-AWARE | IA | 7 | 6 | 0 |

Table 13: Projects addressing "Cybersecurity Governance" close to or ready for adoption

3.1.6 Human Aspects of Cybersecurity

| Radar | Assess | Trial | Adopt | Hold | Drop | TOTAL |
|--|--------|-------|-------|------|------|-------|
| Autumn 2018 | 5 | 0 | 2 | 5 | 8 | 20 |
| Spring 2019 | 6 | 0 | 5 | 3 | 1 | 15 |
| Autumn 2019 | 2 | 5 | 2 | 6 | 1 | 16 |
| Spring 2020 | 1 | 1 | 5 | 5 | 3 | 15 |
| Autumn 2020 | 1 | 0 | 4 | 4 | 5 | 14 |
| Spring 2021 (Live May 31 st 2021) | 0 | 1 | 1 | 5 | 5 | 12 |

Table 14: “Human Aspects of Cybersecurity” overview – Spring 2021 (Live May 31st 2021)

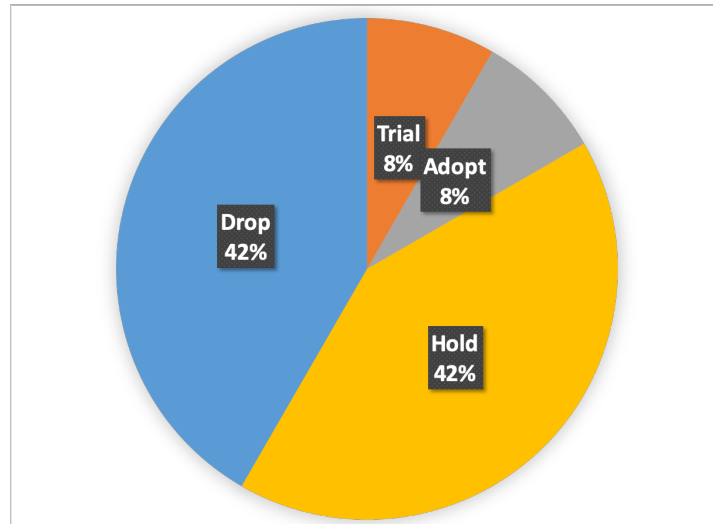


Figure 6: "Human Aspects of Cybersecurity" radar – Spring 2021 (Live May 31st 2021)

This sector continues to be the smallest sector within the radar and of particular concern now is the emptiness of the pipeline of active projects with the majority of projects here (84%) now being completed.

Given the increasing popularity of social engineering in cybersecurity incidents, it is somewhat surprising that we are now in this situation with the projects as assessed as one should consider that within the CS & P landscape. "Human Aspects of Cybersecurity" is the one sector in the radar that most clearly represents fundamental research. Unfortunately, as we had previously identified this most fundamental factor of effective cybersecurity appears to still be orphaned.

There is only a single project that we consider within the project lifetime as adoptable though it has not completed an MTRL assessment so we are unable to definitively say it is adoptable.

3.2 Analysis of radar since the Spring 2019 Technology Radar

3.2.1 Statistical analysis of 3 years of Projects Radar data gathering

| Radar edition | Secure Systems | Verification & Assurance | Operational Risk | Identity & Privacy | Cybersecurity Governance | Human Aspects | TOTAL |
|---------------|----------------|--------------------------|------------------|--------------------|--------------------------|---------------|-------|
| Autumn 2018 | 47 | 16 | 20 | 19 | 12 | 20 | 134 |
| Spring 2019 | 80 | 15 | 24 | 24 | 17 | 15 | 175 |
| Autumn 2019 | 89 | 17 | 28 | 24 | 17 | 16 | 191 |
| Spring 2020 | 87 | 18 | 29 | 24 | 17 | 15 | 190 |
| Autumn 2020 | 81 | 17 | 27 | 22 | 17 | 14 | 178 |
| Spring 2021 | 65 | 12 | 24 | 16 | 15 | 12 | 144 |

Table 15: Distribution of projects per sector across Radars.

Since the first edition of the radar in Autumn 2018, when only one compiled data set was available, we are now in the position to analyse the landscape better, using the full set of six data sets compiled in 6-month cycles (see Table 15).

We have already noted multiple times in this and previous reports we can clearly see the “explosion” of project entries in our database, as much to do with our own startup and struggle to initially capture high quality data as anything attributable to the project landscape itself. We now have as near a complete view of the landscape available as is possible and therefore the data set collected now resembles a statistically representative sample of projects in the EU CS & P landscape. We also assume that the unrepresentative nature of Autumn 2018 means that we may discount it from statistics discussed.

Looking at the growth figures year on year from Spring 2019 to Spring 2021 (Table 15) we can immediately see that generally until Spring 2020 there was what could be termed as either growth or at least continuity within the limits of what could be termed uncertainty in the dataset. Since Spring 2020 though there has been a significant decrease in the population of projects, firstly in the six months until the Autumn 2020 radar (12 projects) and then most precipitously between that and this, the most recent report, Spring 2021 (34 projects). The largest decrease is within the “Verification and Assurance” sector which has suffered a decrease of more than 40%, though “Identity and Privacy” is of a similar magnitude. A key note here though is that these are both from extremely small samples and so the extremely large percentage decreases may only be an artifact of the statistics.

While “Secure Systems” appears to grow in line with the overall increase in projects (by 9%), “Verification and Assurance” and “Operational Risk” grew disproportionately. This is a good sign in that this appears to reflect the need of much greater formal assurance and cryptographically stronger functions and services, as well as strengthening operational preparedness and management of cybersecurity risks. On the flipside, however, “Identity & Privacy”, “Cybersecurity Governance”, and “Human Aspects” fall behind with no growth at all.

Over valid years, the distribution of projects across the six sectors of the remains remarkably stable (see Table 16) with three clear clusters of “market share”:

1. **Secure Systems**

Most dominant by far – 45% of all projects.

2. **Operational Risk, Identity & Privacy**

Low interest; about 1/6 each in terms of projects

3. **Verification & Assurance, Cybersecurity Governance, Human Aspects**

Lowest interest, not even 10% share of each sector across the radars

| Radar edition | Secure Systems | Verification & Assurance | Operational Risk | Identity & Privacy | Cybersecurity Governance | Human Aspects | TOTAL |
|----------------|----------------|--------------------------|------------------|--------------------|--------------------------|---------------|-------|
| Autumn 2018 | 35% | 12% | 15% | 14% | 9% | 15% | 100% |
| Spring 2019 | 46% | 9% | 14% | 14% | 10% | 9% | 100% |
| Autumn 2019 | 47% | 9% | 15% | 13% | 9% | 8% | 100% |
| Spring 2020 | 46% | 9% | 15% | 13% | 9% | 8% | 100% |
| Autumn 2020 | 46% | 10% | 15% | 12% | 10% | 8% | 100% |
| Spring 2021 | 45% | 8% | 17% | 11% | 10% | 8% | 100% |
| Change in year | -1% | -1% | 2% | -2% | 1% | - | |

Table 16: Relative size of sectors per radar (individual values may not add to 100% due to rounding).

As we have previously shown, [4] a pattern emerges when comparing the distribution of projects across sectors throughout the radars with the distribution of project budgets on the same scales. As the number of projects that have been included have changed so little then that analysis is not specifically repeated though the lighthouse projects previously included which are still included in the Spring 2021 radar are listed in Table 17.

| Radar sector | Project | Project budget | Sector budget |
|--------------------------|-----------------|----------------|---------------|
| Secure Systems | SCOTT | 39 M€ | 387 M€ |
| Verification & Assurance | SECRETAS | 51 M€ | 118 M€ |
| Cybersecurity Governance | CyberSec4Europe | 16 M€ | 109 M€ |
| | SPARTA | 16 M€ | |
| | CONCORDIA | 16 M€ | |
| | ECHO | 16 M€ | |

Table 17: Lighthouse projects impacting the funding distribution across radar sectors – Spring 2021

With the decrease in number of projects in the radar now these projects do of course now constitute a much larger proportion of the funding available within each sector.

3.2.2 Overview of the Projects Radar Spring 2021

Figure 7 shows the visual representation of the Spring 2021 edition of the Cyberwatching.eu Projects Radar. What is statistically most evident is reflected here as well, i.e. Secure Systems is by far the most dominant sector, hosting 45% of all projects that are included in this edition. Compared to that, all other sectors are significantly depleted.

All sectors but one show some aspects of an assured pipeline of projects entering at the Assess stage. The exception to this pattern is “Human Aspects”, which is extremely worrying with only two projects now in the sector that are not either in Hold or Drop, i.e. they have ended. This indicates that funding for this fundamental aspect of cybersecurity has dried out. Significant action is needed to correct this significant oversight in the funding landscape.

The colour indication for projects now shows that overall the majority of displayed projects have responded to cyberwatching.eu's efforts in engaging with projects it is supporting; and our strategy of focussing on projects that are still active bears fruit: Within the inner three rings (Assess, Trial, Adopt) more than two thirds of all projects have submitted MTRL self-assessments to Cyberwatching.eu Task 2.3.

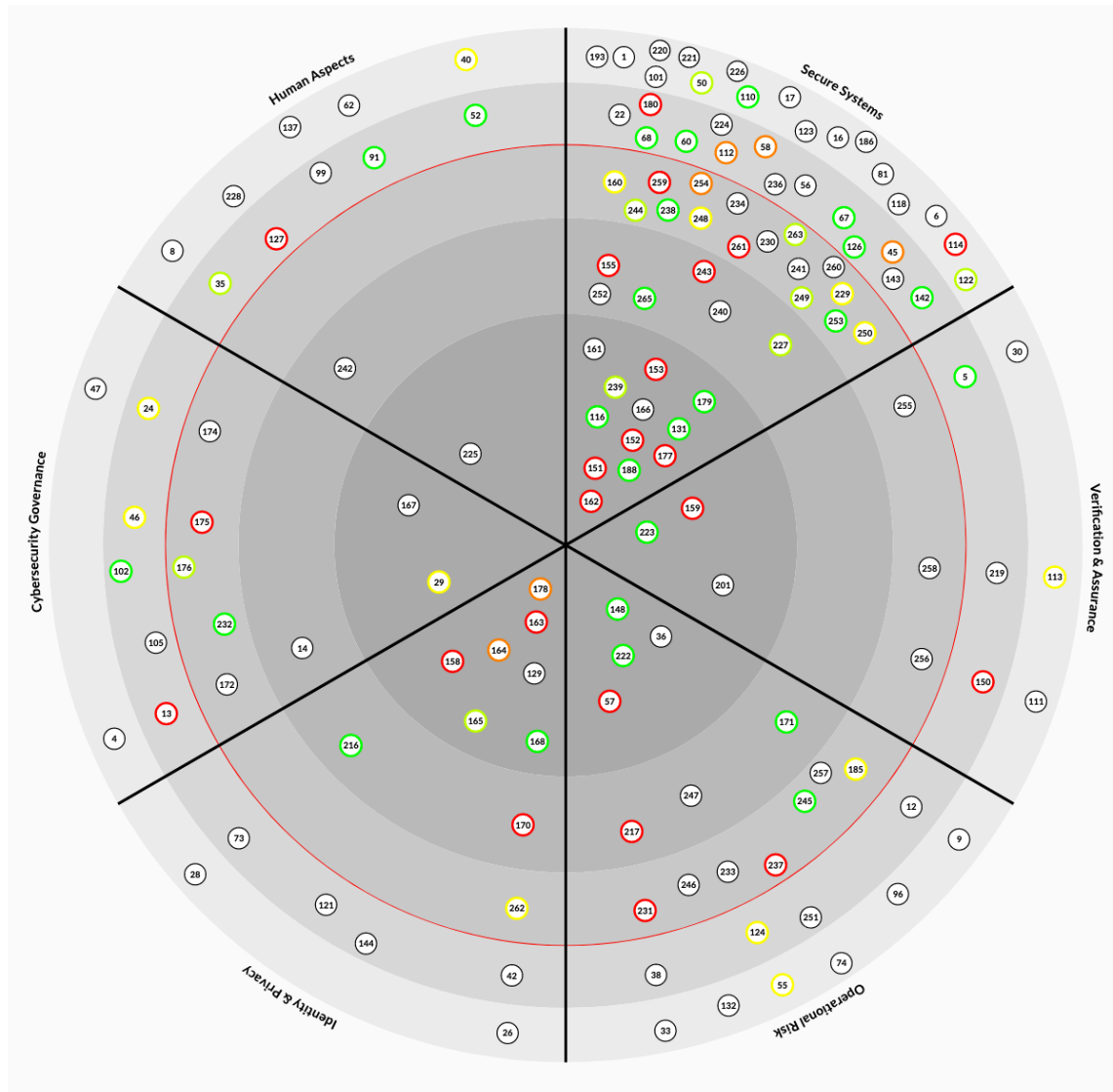


Figure 7: The Spring 2021 CS & P Projects Radar, segments from top right to top left: Secure Systems, Verification & Assurance, Operational Risk, Identity and Privacy, Cybersecurity Governance, Human Aspects

3.3 Assessment of projects against the JRC Taxonomy

With this live version of the Radar we are now of course able to interact dynamically with the radar. As such we have included as discussed previously the JRC Cybersecurity Taxonomy [5] as a method to tag and hence filter projects within the radar. All projects that have engaged with cyberwatching.eu to receive an MTRL assessment have also been classified against this taxonomy as well as a number of the most recent additions to the hub. As such we will now work through numbers of projects that have been classified against each. These are shown in Table 18.

| JRC Taxonomy Element | Technology Radar Sector | | | | | | Total | Total Value |
|--|-------------------------|--------------------------|------------------|--------------------|--------------------------|---------------|-------|-------------|
| | Secure Systems | Verification & Assurance | Operational Risk | Identity & Privacy | Cybersecurity Governance | Human Aspects | | |
| Cybersecurity domains | 11 | 7 | 12 | 6 | 15 | 5 | 77 | 487.56M€ |
| Assurance, Audit, and Certification | 1 | 1 | 2 | 1 | 5 | - | 10 | 100.16M€ |
| Cryptology (Cryptography and Cryptanalysis) | - | 1 | 2 | 2 | 1 | 1 | 7 | 48.31M€ |
| Data Security and Privacy | 18 | 3 | 6 | 6 | 6 | 3 | 42 | 278.33M€ |
| Education and Training | 9 | - | 3 | - | 6 | 2 | 20 | 156.64M€ |
| Human Aspects | 4 | - | 3 | - | 3 | 5 | 15 | 104.72M€ |
| Identity Management | 2 | - | 2 | 2 | 2 | - | 8 | 57.75M€ |
| Incident Handling and Digital Forensics | 3 | 2 | 4 | - | 3 | - | 12 | 95.04M€ |
| Legal Aspects | - | - | - | 1 | 2 | 1 | 4 | 39.35M€ |
| Network and Distributed Systems | 8 | - | 2 | - | 1 | - | 11 | 83.92M€ |
| Security Management and Governance | 4 | 2 | 5 | - | 7 | - | 18 | 197.88M€ |
| Security Measurements | 6 | - | 4 | - | 2 | - | 12 | 91.20M€ |
| Software and Hardware Security Engineering | 12 | 2 | 5 | 1 | 3 | - | 23 | 140.28M€ |
| Steganography, Steganalysis and Watermarking | - | - | - | - | 1 | - | 1 | 16.00M€ |
| Theoretical Foundations | - | - | - | - | 1 | - | 1 | 16.00M€ |
| Trust Management and Accountability | 1 | 1 | 3 | - | 1 | - | 6 | 41.8M€ |
| Sectors | 15 | 5 | 8 | 7 | 15 | 3 | 75 | 479.46M€ |
| Audiovisual and media | 1 | - | - | - | 1 | - | 2 | 18.73M€ |
| Chemical | 3 | - | - | - | 1 | - | 4 | 35.01M€ |
| Defence | 1 | - | - | - | 1 | - | 2 | 18.73M€ |
| Digital Services and Platforms | 13 | 4 | 4 | 4 | 4 | 4 | 33 | 206.25M€ |
| Energy | 9 | - | 2 | 1 | 3 | 1 | 16 | 107.63M€ |
| Financial | 3 | 1 | 3 | 1 | 1 | - | 9 | 48.02M€ |
| Food and Drink | 1 | - | - | - | 1 | - | 2 | 18.73M€ |
| Government | 4 | - | 2 | 3 | 4 | - | 13 | 88.23M€ |
| Health | 13 | 1 | 3 | 2 | 2 | 1 | 22 | 132.54M€ |
| Manufacturing and Supply Chains | 6 | - | 2 | - | 2 | - | 10 | 66.38M€ |
| Nuclear | 2 | - | - | - | 1 | - | 3 | 24.87M€ |
| Safety and Security | 10 | 4 | 6 | 1 | 3 | - | 24 | 124.47M€ |
| Space | 1 | - | - | - | 2 | - | 3 | 34.71M€ |
| Telecomm Infrastructure | 3 | - | - | - | 1 | - | 4 | 27.87M€ |
| Transportation | 10 | 1 | 2 | 2 | 4 | - | 19 | 166.75M€ |
| Technology & Use Cases | 15 | 11 | 12 | 7 | 21 | 4 | 74 | 477.55M€ |
| Artificial Intelligence | 7 | 1 | 3 | 1 | 4 | - | 16 | 112.12M€ |
| Big Data | 6 | - | 1 | 1 | 3 | 1 | 12 | 84.86M€ |

| | | | | | | | | |
|--|----|---|---|---|---|---|----|----------|
| Blockchain and Distributed Ledger Technology (DLT) | 8 | 1 | 7 | 2 | 2 | 2 | 22 | 135.18M€ |
| Cloud, Edge and Virtualisation | 5 | 1 | 3 | 2 | 1 | - | 12 | 61.70M€ |
| Critical Infrastructure Protection (CIP) | 12 | 2 | 3 | - | 3 | - | 20 | 149.36M€ |
| Protection of public spaces | - | - | 1 | - | 1 | - | 2 | 21.69M€ |
| Disaster resilience and crisis management | 1 | - | - | - | 1 | - | 2 | 26.14M€ |
| Fight against crime and terrorism | - | - | - | - | 1 | - | 1 | 16.00M€ |
| Border and external security | - | - | - | - | 1 | - | 1 | 16.00M€ |
| Local/wide area observation and surveillance | - | 1 | - | - | 1 | - | 2 | 16.18M€ |
| Hardware technology (RFID, chips, sensors, networking, etc.) | 2 | - | 2 | - | 1 | - | 5 | 30.08M€ |
| High-performance computing (HPC) | - | - | - | - | 1 | - | 1 | 16.00M€ |
| Human Machine Interface (HMI) | 1 | - | 1 | - | 1 | - | 3 | 28.12M€ |
| Industrial IoT and Control Systems (e.g. SCADA and Cyber Physical Systems) | 7 | 1 | 2 | - | 1 | - | 12 | 83.97M€ |
| Information Systems | 7 | 1 | 4 | 2 | 4 | 1 | 19 | 101.37M€ |
| Internet of Things, embedded systems, pervasive systems | 12 | 1 | 5 | 1 | 5 | 1 | 25 | 200.89M€ |
| Mobile Devices | 7 | - | - | - | 1 | - | 8 | 46.11M€ |
| Operating Systems | 1 | 1 | - | - | 1 | - | 3 | 24.3M€ |
| Quantum Technologies (e.g. computing and communication) | - | 1 | - | - | 1 | - | 2 | 20.87M€ |
| Robotics | 2 | - | - | - | - | - | 2 | 5.56M€ |
| Satellite systems and applications | - | - | - | - | 1 | - | 1 | 15.99M€ |
| Vehicular Systems (e.g. autonomous vehicles) | 3 | 1 | 2 | 1 | 1 | - | 8 | 92.19M€ |
| UAV (unmanned aerial vehicles) | - | - | - | - | - | - | 0 | 0.00€ |

Table 18: Number of projects per taxonomy element

The ability to segment the landscape based on a separate orthogonal taxonomy is extremely useful. It should be noted that the taxonomy is additive, i.e. that the viewer is able to select multiple attributes to filter upon which can be used in either a summative or exclusive manner, i.e. you may select projects based on projects that have any one of the multiple attributes selected or you may select projects based on only those project that have all of the attributes selected. Due to the large number of taxonomy elements we have not tried to collect statistics on these combinations but have presented an example in Figure 8. Here we show all projects that are working in the *Health* or *Energy* sectors. This shows that from analysed projects the EC is spending €187.81M on 31 projects with an average budget of €6.06M in these areas. If we then apply an additional filter to select projects in each area that are using *Blockchain and Distributed Ledger Technology (DLT)* then for *Energy* there are 6 projects with a total budget of €43.28M and for *Health* there are 8 projects with a total budget of €46.92M. We believe this filter is a powerful tool which will be used in future

to fully understand the dataset that we have established through the Cyberwatching.eu project hub.

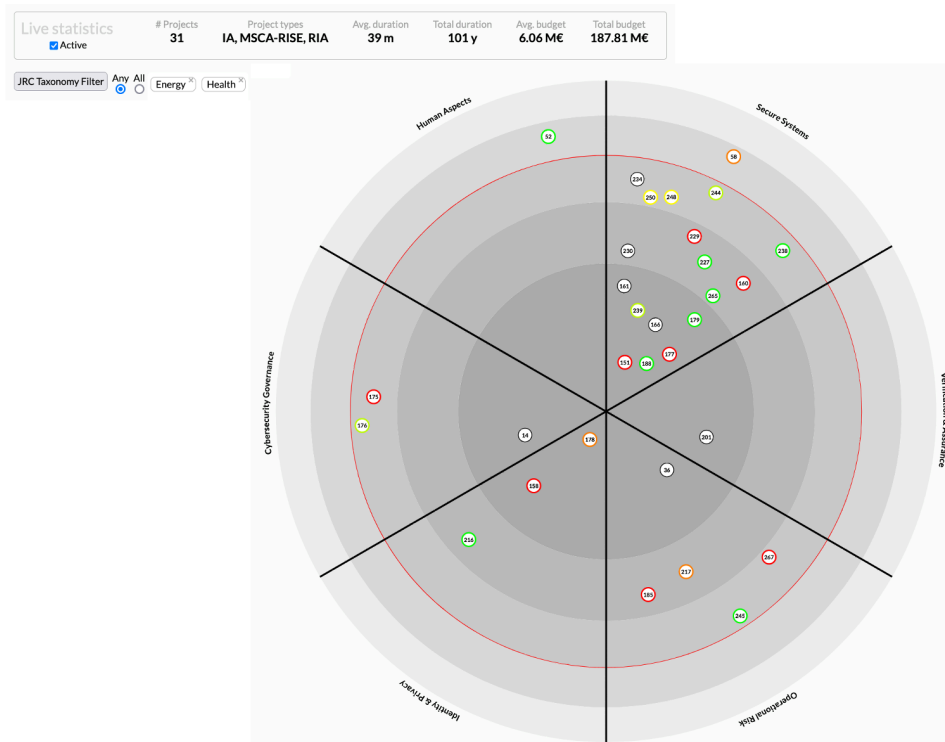


Figure 8: technology radar summary and display for projects from either Energy or Health sectors of the JRC Cybersecurity Taxonomy

4 Commentary & next steps

Having six Projects Radar editions available for analysis allows us to track the development of funding in this critically important area. It is unfortunate that due to the COVID-19 pandemic that our view is slightly changed from what we would have imagined it would have been. This has profoundly changed our perception of the EU CS & P landscape.

Previously, the Secure Systems sector was significantly over represented and this has continued though the total contribution has dropped back from 50% of total projects to 45%. We should note though that Secure Systems are the most important aspect for about 50% of all projects in any of the last five Projects Radars.

At the other end of the scale, Human Aspects and Identity & Privacy were in fact overrepresented in Autumn 2018 and are now significantly the smallest areas of active projects. Human Aspects itself now has only two projects that are actively ongoing within the radar, a situation of significant concern going forward.

Again, we highlight that any of the most pressing cybersecurity and privacy issues are fundamentally socially based and as such we consider that the long-term funding strategy for cybersecurity and privacy must put more focus on Human Aspects, and Identity and Privacy, and less focus on technical solutions addressing the same issue since this area is already heavily supported. This is of particular concern with the newly announced Horizon Europe Cybersecurity calls all being technology focused meaning

that there is likely to be a point in the near future where there are no funded actions that are dealing with human aspects at all. This will mean that there is a gap in the availability to new projects of outputs that may no longer be at the cutting edge when compared to other domains.

Within this edition of the radar we have also been able to implement an orthogonal taxonomy with which we are able to tag projects and implement a filter on those attributes. As such the value of radar has been increased to those particularly who offer funding to the domain so that they are able to quickly and easily understand where funding has gone before over and above the segmentation based on the cyberwatching.eu cybersecurity research sectors. This value will be further demonstrated when considering how we can provide information to possible bidders for Horizon Europe funding who will want to understand upon which project outputs and products they may be able to develop further activities.

Now that the project is nearly at an end we are at the point where we move to sustainability. It is clear with the time-based progression through the radar that without new projects coming on board, being analysed for inclusion in the project hub and then included in the radar that the radar as a tool will start to become less and less useful. We would therefore recommend to the commission that there should be a strategy for the continuation of tools such as this that require small but consistent support to ensure that the initial investment continues to be useful in generating a return. This will be of particular importance with the new Horizon Europe calls and hence new projects join the cybersecurity ecosystem and themselves need to understand their progress and the possible routes to exploitation of their outputs.

5 References

| | |
|---|---|
| 1 | D2.2 Technology Radar 1 st report – Autumn 2018 D Wallom, M Drescher, UOXF, Cyberwatching.eu |
| 2 | The European Projects Radar on cyberwatching.eu web site: https://www.cyberwatching.eu/technology-radar |
| 3 | Cyberthreat trends: 15 cybersecurity threats for 2020, K Porter: https://us.norton.com/internetsecurity-emerging-threats-cyberthreat-trends-cybersecurity-threat-review.html |
| 4 | D2.5 Technology Radar 2 nd report – Autumn 2020 D. Wallom, M. Drescher, UOXF, Cyberwatching.eu |
| 5 | European Cybersecurity Centres of Expertise Map - Definitions and Taxonomy, JRC111441, http://dx.doi.org/10.2760/622400 |

6 Appendix 1: EC funded projects reference

The following projects have been included and analysed in this deliverable, in alphabetical order:

| Project | Call | Type | Start | End |
|----------------|-----------------------|---------------|----------|----------|
| 1-SWARM | ICT-01-2019 | RIA | Jan 2020 | Dec 2022 |
| 3ants | SMEInst-13-2016-2017 | SME-1 | Jul 2017 | Dec 2017 |
| 5GZORRO | ICT-20-2019-2020 | RIA | Nov 2019 | Apr 2022 |
| AARC2 | EINFRA-22-2016 | RIA | May 2017 | Apr 2019 |
| ABC4Trust | ICT-2009.1.4 | CP | Nov 2010 | Feb 2015 |
| ADDPRIV | SEC-2010.6.5-2 | CP | Feb 2011 | Mar 2014 |
| ADVERSARY | EIC-SMEInst-2018-2020 | SME-1 | Nov 2018 | Feb 2019 |
| AEGIS | DS-05-2016 | CSA | May 2017 | Apr 2019 |
| AERAS | MSCA-RISE-2019 | MSCA-RISE | Dec 2019 | Nov 2023 |
| AF-Cyber | MSCA-IF-2016 | MSCA-IF-EF-ST | Feb 2018 | Jan 2020 |
| ANASTACIA | DS-01-2016 | RIA | Jan 2017 | Dec 2019 |
| ARIES | FCT-09-2015 | RIA | Sep 2016 | Feb 2019 |
| ARMOUR | ICT-12-2015 | RIA | Feb 2016 | Jan 2018 |
| ASAP | ERC-AG-PE6 | ERC-AG | Oct 2012 | Sep 2018 |
| ASCEMA | SMEInst-01-2016-2017 | SME-1 | Jun 2016 | Nov 2016 |
| ASCLEPIOS | SU-TDS-02-2018 | RIA | Dec 2018 | Nov 2021 |
| ASTRID | H2020-DS-SC7-2017 | RIA | May 2018 | Apr 2021 |
| ATENA | DS-03-2015 | IA | May 2016 | Apr 2019 |
| BEACON | ICT-07-2014 | RIA | Feb 2015 | Jul 2017 |
| BIOSEC | FP7-PEOPLE-IOF-2008 | MC-IOF | Mar 2009 | Feb 2012 |
| Blocknetwork | EIC-SMEInst-2018-2020 | SME-1 | Sep 2018 | Feb 2019 |
| BPR4GDPR | H2020-DS-SC7-2017 | IA | May 2018 | Apr 2021 |
| C3ISP | DS-04-2015 | IA | Oct 2016 | Sep 2019 |
| C4IIoT | SU-ICT-01-2018 | IA | Jun 2019 | May 2022 |
| CANVAS | DS-07-2015 | CSA | Sep 2016 | Aug 2019 |
| CAPITAL | ICT-2013.1.5 | CSA | Oct 2013 | Sep 2015 |
| CARAMEL | SU-ICT-01-2018 | IA | Oct 2019 | Mar 2022 |
| CE-IoT | H2020-MSCA-RISE-2017 | MSCA-RISE | Jul 2018 | Jun 2022 |
| certMILS | DS-01-2016 | IA | Jan 2017 | Dec 2020 |
| CHINO | SMEInst-13-2016-2017 | SME-1 | Jan 2017 | Jun 2017 |
| CHOReVOLUTION | ICT-09-2014 | RIA | Jan 2015 | Dec 2017 |
| CIPSEC | DS-03-2015 | IA | May 2016 | Apr 2019 |
| CITADEL | DS-03-2015 | IA | Jun 2016 | May 2019 |
| CLARUS | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| CloudSocket | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| CloudTeam | ICT-07-2014 | IA | Mar 2015 | Feb 2017 |
| CLRe | SMEInst-01-2016-2017 | SME-1 | Jun 2017 | Nov 2017 |
| COCKPITCI | SEC-2011.2.5-1 | CP-FP | Jan 2012 | Dec 2014 |
| COEMS | ICT-10-2016 | RIA | Nov 2016 | Oct 2019 |
| COLA | ICT-06-2016 | IA | Jan 2017 | Jun 2019 |
| COMPACT | DS-02-2016 | IA | May 2017 | Oct 2019 |
| CONCORDIA | H2020-SU-ICT-2018-2 | RIA | Jan 2019 | Dec 2022 |
| ConnectProtect | SMEInst-13-2016-2017 | SME-1 | Jul 2016 | Dec 2016 |
| CONSENT | SSH-2009-3.2.1. | CP-FP | May 2010 | Apr 2013 |
| CREATE-IoT | H2020-IOT-2016 | CSA | Jan 2017 | Dec 2019 |

| Project | Call | Type | Start | End |
|------------------|-----------------------|----------------|----------|----------|
| CREDENTIAL | DS-02-2014 | IA | Oct 2015 | Sep 2018 |
| CRITICAL-CHAINS | SU-DS05-2018-2019 | IA | Jul 2019 | Jun 2022 |
| CROSSMINER | ICT-10-2016 | RIA | Jan 2017 | Dec 2019 |
| CryptoCloud | ERC-AG-PE6 | ERC-AG | Jun 2014 | May 2019 |
| CS-AWARE | DS-02-2016 | IA | Sep 2017 | Aug 2020 |
| CUREX | SU-TDS-02-2018 | RIA | Dec 2018 | Nov 2021 |
| CYBECO | DS-04-2016 | RIA | May 2017 | Apr 2019 |
| CYBECO II | H2020-DS-SC7-2016 | RIA | May 2017 | Apr 2019 |
| Cyber-MAR | SU-DS01-2018 | IA | Sep 2019 | Aug 2022 |
| CYBER-TRUST | H2020-DS-SC7-2017 | RIA | May 2018 | Apr 2021 |
| CYBERCULT | MSCA-IF-2018 | MSCA-IF-EF-ST | Jul 2019 | Jun 2021 |
| CyberSANE | SU-ICT-01-2018 | IA | Sep 2019 | Aug 2022 |
| CyberSec4Europe | H2020-SU-ICT-2018-2 | RIA | Mar 2019 | Jul 2022 |
| CYBERSECURITY | MSCA-IF-2017 | MSCA-IF-EF-ST | Aug 2018 | Jul 2020 |
| CyberSure | MSCA-RISE-2016 | MSCA-RISE | Jan 2017 | Dec 2020 |
| cyberwatching.eu | DS-05-2016 | CSA | May 2017 | Apr 2021 |
| CYBERWISER.EU | H2020-EU.3.7.4 | IA | Sep 2018 | Feb 2021 |
| CyberWiz | DRS-17-2014 | SME-2 | Sep 2015 | Aug 2017 |
| CYCLONE | ICT-07-2014 | IA | Jan 2015 | Dec 2017 |
| CYRail | S2R-OC-IP2-01-2015 | Shift2Rail-RIA | Oct 2016 | Sep 2018 |
| D-FENCE | EIC-SMEInst-2018-2020 | SME-1 | May 2019 | Aug 2019 |
| DAN | EIC-SMEInst-2018-2020 | SME-1 | Oct 2019 | Mar 2020 |
| DAPPER | FP7-PEOPLE-2013-CIG | MC-CIG | Apr 2014 | Mar 2018 |
| DECODE | ICT-12-2016 | RIA | Dec 2016 | Nov 2019 |
| DECODE | H2020-ICT-2016-1 | RIA | Dec 2016 | Dec 2019 |
| DEFEND | H2020-DS-SC7-2017 | IA | Jun 2018 | May 2021 |
| DEFENDER | CIP-01-2016-2017 | IA | May 2017 | Apr 2020 |
| DISCOVERY | ICT-38-2015 | CSA | Jan 2016 | Dec 2017 |
| DiSIEM | DS-04-2015 | IA | Sep 2016 | Aug 2019 |
| DITAS | ICT-06-2016 | RIA | Jan 2017 | Dec 2019 |
| DOGANA | DS-06-2014 | IA | Sep 2015 | Aug 2018 |
| DOGANA II | | IA | Jan 2017 | Dec 2019 |
| DSSC | MSCA-COFUND-2016 | MSCA-COFUND-DP | May 2017 | Apr 2022 |
| e-Sides | ICT-18-2016 | CSA | Jan 2017 | Dec 2019 |
| ECHO | H2020-SU-ICT-2018-2 | RIA | Mar 2019 | Feb 2023 |
| ECRYPT-CSA | ICT-32-2014 | CSA | Mar 2015 | Feb 2018 |
| ECRYPT-NET | MSCA-ITN-2014-ETN | MSCA-ITN-ETN | Mar 2015 | Feb 2019 |
| ELIoT Pro | EIC-SMEInst-2018-2020 | SME-2 | Jun 2018 | May 2020 |
| ENACT | H2020-IOT-2017 | RIA | Jan 2018 | Dec 2020 |
| ENCASE | MSCA-RISE-2015 | MSCA-RISE | Jan 2016 | Dec 2019 |
| EnergyShield | SU-DS04-2018-2020 | IA | Jul 2019 | Jun 2022 |
| EU-SEC | DS-01-2016 | IA | Jan 2017 | Dec 2019 |
| EUNITY | DS-05-2016 | CSA | Jun 2017 | May 2019 |
| Eye-O-T | SMEInst-13-2016-2017 | SME-1 | Aug 2016 | Dec 2016 |
| FAR-EDGE | H2020-FOF-2016 | RIA | Oct 2016 | Oct 2019 |
| FeatureCloud | SU-TDS-02-2018 | RIA | Jan 2019 | Dec 2023 |
| FENTEC | H2020-DS-LEIT-2017 | RIA | Jan 2018 | Dec 2020 |
| FIDELITY | SEC-2011.3.4-1 | CP-IP | Feb 2012 | Jan 2016 |
| FORESIGHT | SU-DS01-2018 | IA | Oct 2019 | Sep 2022 |

| Project | Call | Type | Start | End |
|----------------|---------------------------|----------------|----------|----------|
| FORTIKA | DS-02-2016 | IA | Jun 2017 | May 2020 |
| FUTURE TPM | H2020-DS-LEIT-2017 | RIA | Jan 2018 | Dec 2020 |
| FutureTrust | DS-05-2015 | IA | Jun 2016 | May 2019 |
| GenoPri | MSCA-IF-2015-EF | MSCA-IF-EF-ST | May 2016 | Apr 2018 |
| GHOST | <u>DS-02-2016</u> | IA | May 2017 | Apr 2020 |
| GO 4G | SMEInst-13-2016-2017 | SME-1 | Jul 2017 | Dec 2017 |
| GUARD | SU-ICT-01-2018 | IA | May 2019 | Apr 2022 |
| HEAT | ICT-32-2014 | RIA | Jan 2015 | Dec 2017 |
| HECTOR | ICT-32-2014 | RIA | Mar 2015 | Feb 2018 |
| HERMENEUT | DS-04-2016 | RIA | May 2017 | Apr 2019 |
| HIPS | ERC-CG-2013-PE6 | ERC-CG | Oct 2014 | Sep 2019 |
| IMPACT | ERC-2013-SyG | ERC-SyG | Feb 2015 | Jan 2021 |
| InfraStress | SU-INFRA01-2018-2019-2020 | IA | Jun 2019 | May 2021 |
| INSPIRE-5Gplus | ICT-20-2019-2020 | RIA | Nov 2019 | Oct 2022 |
| IPaCSO | ICT-2013.1.5 | CSA | Nov 2013 | Oct 2015 |
| KONFIDO | DS-03-2016 | RIA | Nov 2016 | Oct 2019 |
| KRAKEN | H2020-ICT-2019-2 | IA | Dec 2019 | Nov 2022 |
| LAST | ERC-SG-PE6 | ERC-SG | Oct 2009 | Sep 2014 |
| LIGHTest | DS-05-2015 | IA | Sep 2016 | Aug 2019 |
| LIMPET | SMEInst-09-2016-2017 | SME-1 | Feb 2017 | Jul 2017 |
| LipVerify | SMEInst-13-2016-2017 | SME-1 | Jul 2016 | Dec 2016 |
| LOCARD | SU-FCT02-2018-2019-2020 | RIA | May 2019 | Apr 2022 |
| LocationWise | SMEInst-13-2016-2017 | SME-1 | Mar 2017 | Aug 2017 |
| LV-Pri20 | MSCA-IF-2014-EF | MSCA-IF-EF-CAR | Jun 2015 | Jun 2017 |
| MALAGA | MSCA-IF-2018 | MSCA-IF-EF-ST | Sep 2019 | Oct 2021 |
| MAMI | ICT-12-2015 | RIA | Jan 2016 | Jun 2018 |
| MAPPING | SiS.2013.1.2-1 | CSA-SA | Mar 2014 | Feb 2018 |
| MAS2TERING | ICT-2013.6.1 | CP | Sep 2014 | Aug 2017 |
| MATTHEW | ICT-2013.1.5 | CP | Nov 2013 | Oct 2016 |
| MELODIC | ICT-06-2016 | RIA | Dec 2016 | Nov 2019 |
| mF2C | ICT-06-2016 | RIA | Jan 2017 | Dec 2019 |
| MH-MD | ICT-18-2016 | RIA | Nov 2016 | Oct 2019 |
| MIKELANGELO | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| MITIGATE | DS-06-2014 | IA | Sep 2015 | Feb 2018 |
| MUSA | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| NECOMA | ICT-2013.10.1 | CP | Jun 2013 | Mar 2016 |
| NeCS | MSCA-ITN-2015-ETN | MSCA-ITN-ETN | Sep 2015 | Aug 2019 |
| nIoVe | SU-ICT-01-2018 | IA | May 2019 | Apr 2022 |
| OCGN | MSCA-IF-2015-EF | MSCA-IF-EF-ST | May 2017 | Nov 2018 |
| OCRE | H2020-INFRAEOSC-2018-1 | RIA | Jan 2019 | Dec 2021 |
| OCTAVE | DS-02-2014 | IA | Jun 2015 | Jul 2017 |
| ODIX 2.0 | EIC-SMEInst-2018-2020 | SME-2 | Jun 2019 | Jun 2021 |
| OLYMPUS | H2020-DS-SC7-2017 | IA | Sep 2018 | Aug 2021 |
| OPENREQ | ICT-10-2016 | RIA | Jan 2017 | Dec 2019 |
| OPERANDO | DS-01-2014 | IA | May 2015 | Apr 2018 |
| P5 | SEC-2012.2.3-1 | CP-FP | Aug 2013 | Oct 2016 |
| PaaSword | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| PACT | SEC-2011.6.5-2 | CP-FP | Feb 2012 | Jan 2015 |
| PANACEA | H2020-SC1-FA-DTS-2018-1 | RIA | Jan 2019 | Dec 2021 |

| Project | Call | Type | Start | End |
|----------------------|---------------------------|--------------|----------|----------|
| PANOPTESSEC | ICT-2013.1.5 | CP | Nov 2013 | Oct 2016 |
| PANORAMIX | DS-01-2014 | IA | Sep 2015 | Aug 2018 |
| PAPAYA | H2020-DS-SC7-2017 | IA | May 2018 | Apr 2021 |
| PARIS | SEC-2012.6.1-2 | CP-FP | Jan 2013 | Feb 2016 |
| PASS | PEOPLE-2007-4-3.IRG | MC-IRG | Dec 2008 | Nov 2012 |
| PATS | SiS-2008-1.2.2.1 | CSA-SA | Aug 2009 | Mar 2012 |
| PDP4E | H2020-DS-SC7-2017 | IA | May 2018 | Jan 2021 |
| PerfectDashboard 2.0 | SMEInst-13-2016-2017 | SME-1 | Oct 2016 | Dec 2016 |
| PHOENIX | SU-DS04-2018-2020 | IA | Sep 2019 | Aug 2022 |
| PICOS | ICT-2007.1.4 | CP | Feb 2008 | Jun 2011 |
| POSEIDON | H2020-DS-SC7-2017 | IA | May 2018 | Oct 2020 |
| PQCRYPTO | ICT-32-2014 | RIA | Mar 2015 | Feb 2018 |
| PRACTIS | SiS-2009-1.1.2.1 | CP-FP | Jan 2010 | Mar 2013 |
| PRECIOSA | ICT-2007.6.2 | CP | Mar 2008 | Aug 2010 |
| PRESCIENT | SiS-2009-1.1.2.1 | CP-FP | Jan 2010 | Mar 2013 |
| PreserviX | ICT-37-2014-1 | SME-1 | May 2015 | Oct 2015 |
| PrEstoCloud | ICT-06-2016 | RIA | Jan 2017 | Dec 2019 |
| PrimeLife | ICT-2007.1.4 | CP | Mar 2008 | Jun 2011 |
| PRIPARE | ICT-2013.1.5 | CSA | Oct 2013 | Sep 2015 |
| PRISM | ICT-2007.1.4 | CP | Mar 2008 | May 2010 |
| PRISM CODE | FP7-PEOPLE-2012-CIG | MC-CIG | Nov 2012 | Oct 2016 |
| PRISMACLOUD | ICT-32-2014 | RIA | Feb 2015 | Jul 2018 |
| PRISMS | SEC-2011.6.5-2 | CP-FP | Feb 2012 | Jul 2015 |
| PRIVACY FLAG | DS-01-2014 | IA | May 2015 | Apr 2018 |
| <u>Privacy.U.s</u> | MSCA-ITN-2015-ETN | MSCA-ITN-ETN | Dec 2015 | Nov 2019 |
| PRIVACY4FORENSICS | FP7-PEOPLE-2013-IIF | MC-IIF | Feb 2015 | Mar 2018 |
| PRIVILEGE | H2020-DS-LEIT-2017 | RIA | Jan 2018 | Dec 2020 |
| ProBOS | SMEInst-13-2016-2017 | SME-2 | Oct 2016 | Sep 2018 |
| PROMETHEUS | H2020-DS-LEIT-2017 | RIA | Jan 2018 | Dec 2019 |
| PROOFY | SMEInst-01-2016-2017 | SME-1 | May 2017 | Aug 2017 |
| PROTASIS | H2020-MSCA-RISE-2015 | MSCA-RISE | May 2016 | Apr 2020 |
| PROTECTIVE | DS-04-2015 | IA | Sep 2016 | Aug 2019 |
| ProtonSuite | SMEInst-13-2016-2017 | SME-1 | Dec 2017 | Mar 2018 |
| Ps2Share | ICT-35-2016 | RIA | Jan 2017 | Dec 2017 |
| RADDICS | ERC-2018-COG | ERC-COG | Jan 2019 | Dec 2023 |
| RAPID | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| REACT | H2020-DS-SC7-2017 | RIA | Jun 2018 | May 2021 |
| REASSURE | DS-01-2016 | RIA | Jan 2017 | Dec 2019 |
| ReCRED | DS-02-2014 | IA | May 2015 | Apr 2018 |
| REDSENTRY | H2020-SMEINST-1-2016-2017 | SME-1 | Jul 2017 | Dec 2017 |
| RESISTO | CIP-01-2016-2017 | IA | May 2018 | Apr 2021 |
| RESPECT | SEC-2011.6.1-5 | CP-FP | Feb 2012 | May 2015 |
| REVEN-X1 | ICT-37-2015-1 | SME-1 | Jul 2015 | Dec 2015 |
| RPS | SMEInst-10-2016-2017 | SME-1 | Jan 2018 | May 2018 |
| SAFECARE | CIP-01-2016-2017 | IA | Sep 2018 | Aug 2021 |
| SafeCloud | DS-01-2014 | IA | Sep 2015 | Aug 2018 |
| SAFEcrypto | ICT-32-2014 | RIA | Jan 2015 | Dec 2018 |
| SAFERtec | DS-01-2016 | RIA | Jan 2017 | Dec 2019 |
| SAFETY 4.0 | SMEInst-02-2016-2017 | SME-1 | Aug 2017 | Nov 2017 |

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|--------------------|---------------------------|-----------|----------|----------|
| SAINT | DS-04-2016 | RIA | Mar 2017 | Feb 2021 |
| Samurai | EIC-SMEInst-2018-2020 | SME-1 | May 2019 | Aug 2019 |
| SAPPAN | H2020-SU-ICT-2018 | IA | May 2019 | Apr 2022 |
| SAURON | CIP-01-2016-2017 | IA | May 2017 | Apr 2019 |
| SAWSOC | FP7-SEC-2012-1 | CP-FP | Nov 2013 | Apr 2016 |
| SCISSOR | ICT-32-2014 | RIA | Jan 2015 | Dec 2017 |
| SCOTT | ECSEL-2016-2-IA-two-stage | IA | May 2017 | Jun 2020 |
| SCR | SMEInst-13-2016-2017 | SME-1 | Jul 2016 | Dec 2016 |
| SDN-microSENSE | H2020-SU-DS-2018 | IA | May 2019 | Apr 2022 |
| SealedGRID | H2020-MSCA-RISE-2017 | MSCA-RISE | Jan 2018 | Dec 2021 |
| SecIoT | INNOSUP-02-2016 | CSA | Sep 2017 | Aug 2018 |
| SECONDO | MSCA-RISE-2018 | MSCA-RISE | Jan 2019 | Dec 2022 |
| SECRETAS | ECSEL-2017-2 | ECSEL-RIA | May 2018 | Apr 2021 |
| SecureCloud | EUB-1-2015 | RIA | Jan 2016 | Dec 2018 |
| SecureHospitals.eu | SU-TDS-03-2018 | CSA | Dec 2018 | Jan 2021 |
| SecureIoT | H2020-IOT-2017 | RIA | Jan 2018 | Dec 2020 |
| SEMIoTICS | H2020-IOT-2017 | RIA | Jan 2018 | Dec 2020 |
| SERECA | ICT-07-2014 | RIA | Mar 2015 | Feb 2018 |
| SERENITI | FP7-PEOPLE-2013-CIG | MC-CIG | Mar 2014 | Feb 2018 |
| SerIoT | H2020-IOT-2017 | RIA | Jan 2018 | Dec 2020 |
| SERUMS | SU-TDS-02-2018 | RIA | Jan 2019 | Dec 2021 |
| SHARCS | ICT-32-2014 | RIA | Jan 2015 | Dec 2017 |
| SHIELD | DS-04-2015 | IA | Sep 2016 | Feb 2019 |
| SHIELD (Health) | DS-03-2016 | RIA | Jan 2017 | Dec 2019 |
| SIGAGuard | SMEInst-13-2016-2017 | SME-1 | Apr 2018 | Jul 2018 |
| SISSDEN | DS-04-2015 | IA | May 2016 | Apr 2019 |
| SMESEC | DS-02-2016 | IA | Jun 2017 | May 2020 |
| SMOOTH | H2020-DS-SC7-2017 | IA | May 2018 | Oct 2020 |
| SocialPrivacy | FP7-PEOPLE-2011-IOF | MC-IOF | Sep 2012 | Aug 2015 |
| SODA | ICT-18-2016 | RIA | Jan 2017 | Dec 2019 |
| SOFIE | H2020-IOT-2017 | RIA | Jan 2018 | Dec 2020 |
| SOTER | SU-DS05-2018-2019 | IA | Jul 2019 | Oct 2021 |
| SPARTA | H2020-SU-ICT-2018-2 | RIA | Feb 2019 | Jan 2022 |
| SPEAR | H2020-DS-SC7-2017 | RIA | May 2018 | Apr 2021 |
| SPECIAL | ICT-18-2016 | RIA | Jan 2017 | Dec 2019 |
| SPECS | FP7-ICT-2013-10 | CP | Nov 2013 | Apr 2016 |
| SpeechXRays | DS-02-2014 | IA | May 2015 | Apr 2018 |
| SPHINX | SU-TDS-02-2018 | RIA | Jan 2019 | Dec 2021 |
| SPIDER | SU-DS01-2018 | IA | Jul 2019 | Jun 2022 |
| SPOOC | ERC-CoG-2014 | ERC-COG | Sep 2015 | Aug 2020 |
| STAMP | ICT-10-2016 | RIA | Dec 2016 | Nov 2019 |
| STOP-IT | CIP-01-2016-2017 | IA | Jun 2017 | May 2021 |
| STORM | EE-13-2014 | RIA | Mar 2015 | Aug 2018 |
| SUNFISH | ICT-07-2014 | RIA | Jan 2015 | Dec 2017 |
| SUPERCLOUD | ICT-07-2014 | RIA | Feb 2015 | Jan 2018 |
| SurPRISE | SEC-2011.6.5-2 | CP-FP | Feb 2012 | Jan 2015 |
| SWITCH | H2020-ICT-2014-1 | RIA | Feb 2015 | Jan 2018 |
| symbloTe | H2020-ICT-2015 | RIA | Jan 2016 | Dec 2018 |
| SysSec | ICT-2009.1.4 | NoE | Sep 2010 | Nov 2014 |

| Project | Call | Type | Start | End |
|----------------|------------------------------|-------------|--------------|------------|
| TFence | SMEInst-13-2016-2017 | SME-1 | Aug 2017 | Nov 2017 |
| THREAT-ARREST | H2020-DS-SC7-2017 | IA | Sep 2018 | Aug 2021 |
| ThreatMark | SMEInst-13-2016-2017 | SME-1 | Aug 2016 | Nov 2016 |
| TORADOR | ICT-16-2015 | RIA | Jan 2016 | Dec 2018 |
| TREDISEC | ICT-32-2014 | RIA | Apr 2015 | Mar 2018 |
| TRINITY | DT-ICT-02-2018 | IA | Jan 2019 | Dec 2022 |
| TrueProactive | EIC-SMEInst-2018-2020 | SME-1 | May 2018 | Aug 2018 |
| TRUESSEC.EU | DS-01-2016 | CSA | Jan 2017 | Dec 2018 |
| TYPES | DS-01-2014 | IA | May 2015 | Oct 2017 |
| U2PIA | SMEInst-13-2016-2017 | SME-1 | Nov 2016 | Mar 2017 |
| UltraFiBi | SMEInst-13-2016-2017 | SME-1 | Oct 2017 | Mar 2018 |
| UNFRAUD | SMEInst-13-2016-2017 | SME-1 | Jun 2017 | Sep 2017 |
| UNICORN | ICT-06-2016 | IA | Jan 2017 | Dec 2019 |
| UP2DATE | ICT-01-2019 | RIA | Jan 2020 | Dec 2022 |
| V-SPHERE | SMEInst-13-2016-2017 | SME-1 | Feb 2018 | May 2018 |
| vACCINE | JTI-CS2-2018-CfP09-SYS-01-11 | CS2-IA | Oct 2019 | Sep 2021 |
| VESSEDIA | DS-01-2016 | RIA | Jan 2017 | Dec 2019 |
| VIRT-EU | ICT-35-2016 | RIA | Jan 2017 | Dec 2019 |
| VisiOn | DS-01-2014 | IA | Jul 2015 | Jun 2017 |
| WISER | DS-06-2014 | IA | Jun 2015 | Nov 2017 |
| WITDOM | ICT-32-2014 | RIA | Jan 2015 | Dec 2017 |
| YAKSHA | H2020-ICT-2017-1 | IA | Jan 2018 | Jun 2020 |