

D3.1 Short-term training courses delivery plan and training Assessment Methodology and related tools

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CYRUS members of consortium

Table 1 Consortium members

Partner name	Short code	Website link
DEEP BLUE SRL	DEEP BLUE	https://dblue.it/en/
CEFRIEL SOCIETA CONSORTILE A RESPONSABILITA LIMITATA	CEFRIEL	https://www.cefriel.com/
SEARCH-LAB	SLAB	https://www.search-lab.hu/
CYBER RANGES	CR	https://www.cyberranges.com/
STOWARZYSZENIE POLSKA PLATFORMA BEZPIECZENSTWA WEWNETRZNEGO	PPHS	https://ppbw.pl/en/
EIT MANUFACTURING CENTRAL GMBH	EITM	https://www.eitmanufacturing.eu/
ITALIENISCHE HANDELSKAMMER FUR DEUTSCHLAND	ITKAM	https://itkam.org/
UNION INTERNATIONALE DES CHEMINS DE FER	UIC	https://uic.org/
EUROPEAN FEDERATION FOR WELDING JOINING AND CUTTING	EFW	https://www.efw.be/
CHAMBER OF HALKIDIKI	EPIHAL	https://epihal.gr/
VIESOJI ISTAIGA LIETUVOS INOVACIJU CENTRAS	LIC	https://lic.lt/en/lithuanian-innovation-center/

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List of abbreviations

Table 2 List of abbreviations

Abbreviation	Explanation
EC	European Commission
EU	European Union
GA	Grant agreement
HaDEA	European Health and Digital Executive Agency
KPI	Key Performance Indicator
PC	Project coordinator
SME	Small and medium-sized enterprises
TM	Transport and Manufacturing
WP	Work package
WPL	Work package leader

1 Executive summary

This document presents the consortium' approach in terms of training assessment methodology and the related tools, as well as the training delivery plans. This process will be divided into two steps. A **pilot version of the training** which will be used to collect feedback from the stakeholders and support the fine-tuning of the training courses. Having worked in close cooperation with various stakeholders at the national level, partners will have built networks of contacts in the selected sectors that will be used during the validation process. This pilot delivery will enhance the effectiveness of the **final version of the training**.

All training activities will be evaluated by **portfolio of the assessment tools** (including pre-, post-, follow up- tests, satisfaction survey, practical exercises on Cyber Range platform, as well as structured interviews) to assess the effectiveness of the proposed methodology and the actual delivery, including the knowledge and skills developed during the implementation of the trainings and the suggestions for improvement of the future trainings.

The training assessment methodology described in this document provides a structured approach to the development and delivery of the training courses for the TM sectors. The methodology ensures that the curriculum is delivered in a consistent and effective manner, and that the learning outcomes are assessed and certified according to established standards.

2 Project overview

Cybersecurity training is fundamental to help employees protect themselves and their companies against cyberattacks and threats. The CYRUS project is a three-year initiative that aims to create novel, more effective and engaging cybersecurity courses than traditional classroom courses. It aims to leverage technologies such as digitalization, virtualization, and e-learning to create training courses that are customized to the specific needs and skills of different categories of users.

The proposed training sessions target – in a customized way - persons covering different roles within organizations, mainly small and medium-sized enterprises (SMEs) and companies belonging to the Transport and Manufacturing (TM) sectors. These are – as an example – new entrants, professionals, managers, and in general all those willing to upskill/reskill themselves in the field of cybersecurity or improve the specialist competencies they already possess.

Within WP3 the cybersecurity training modules across the selected industrial sectors and the different roles within the organisations will be delivered and validated.

2.1 Deliverable Structure

Training delivery refers to the method and process of transferring knowledge and skills to a target audience. Each mode involves a range of formats, tools, and strategies, considering the learning styles, preferences and needs of trainees. Trainers, educators, and employers must be aware of all these factors and adapt them to their needs in order to impart essential information, share crucial expertise, and engage their audience for optimum retention.

This document describes the CYRUS consortium's approach to the training delivery plan development and to the short-term training courses validation and delivery, based on the training materials developed in WP2.

Additionally, this deliverable also includes the training assessment methodology and the related tools (including pre-, post- and follow-up training assessment tests, training satisfaction survey and interviews questionnaires) to be applied to assess the pilot and final training courses, both in terms of participants' satisfaction and knowledge and skill improvement and retention; it is based on the D1.2 Cybersecurity Competence Framework [1] developed in WP1, which include the CYRUS learning paths designed with a modular structure with different levels of proficiency allowing skilling and upskilling routes. The development of learning paths tailored to professional profiles helps in the customisation of training programmes for specific target groups by training providers and other educational partners, guaranteeing the transferability of acquired information and skills to the workplace. In addition, this report determines the common approach for evaluation of the training activities, including enrollment procedures that are a part of the delivery plan.

Overall, the training delivery plan for CYRUS provides an agile implementation scheme that will allow the work to be sequenced taking into account the project team's capabilities and achieving the project objectives within the set timeframe. The process will be divided into two steps: pilot and final phases. A first round of validation of a pilot version of the training will be used to collect feedback from the stakeholders and support the improvement of the training courses. This pilot delivery will enhance the effectiveness of the final version of the training, which will be delivered towards the end of the project. Plans for validation and implementation of short term training courses (pilot and final delivery plans) are described in Chapter 4.

2.2 Adopted framework

The main outputs of D1.2 are the educational framework developed - **Cybersecurity Competence Framework (CyberSecComp)** and the **CYRUS Learning Pathways**. The former is intended to help define a methodology for evaluating training, both in terms of participant satisfaction and improvement and retention of knowledge and skills. It will also support the design and development of personalised training and work-based learning, part of WP2, which will also subsequently benefit WP3. The latter, CYRUS learning pathways, are designed to facilitate the acquisition of cybersecurity knowledge and

skills tailored to learners' individual needs and professional roles. How these solutions can contribute to the development of training evaluation methodologies is further detailed below.

CyberSecComp is providing a structured and comprehensive set of skills, behaviors, and knowledge areas necessary for professionals, focusing on sectors like Transport and Manufacturing, to succeed in cybersecurity roles. It extends beyond traditional frameworks by including roles indirectly involved in cybersecurity, aiming to improve cybersecurity culture for all employees, not just experts. The framework helps develop a methodology for evaluating training courses by:

1. **Identification of Required Competencies:** The CyberSecComp helps to identify the specific cybersecurity competencies, skills, and knowledge required for both technical and non-technical roles within organizations. By outlining these requirements, it provides clarity on what learners need to focus on during their training which is crucial for designing effective courses and selecting appropriate assessment methods.
2. **Designing Training Courses:** Based on the competencies outlined in the framework, training providers can design and develop cybersecurity training courses that address the identified needs. The framework serves as a roadmap for course development, ensuring that the content aligns with the desired capabilities and performance standards.
3. **Common Terminology and Understanding:** The framework establishes a common terminology and shared understanding of cybersecurity competencies across different roles and levels within an organization. This common language facilitates communication between stakeholders, including HR managers, training providers, and employees, enhancing coordination and alignment in training initiatives.

Additionally, the methodology employed in developing the CyberSecComp, as described in the D1.2, involves both top-down and bottom-up approaches. This methodology can serve as a model for evaluating training courses by considering inputs from desk-based studies, expert consultations, focus groups, and validation workshops in WP1. Training courses can be evaluated based on participant feedback, effectiveness in addressing identified competencies, and alignment with learning outcomes.

CYRUS learning pathways are designed to facilitate the acquisition of cybersecurity knowledge and skills tailored to individual learners' needs and professional roles. Learners are encouraged to self-assess and adjust goals, with modular structures enabling upskilling and reskilling. These pathways help tailor courses to specific groups, ensuring efficient knowledge transfer to real-world contexts but also build the basis for evaluation of training by:

1. **Individualised Routes for Learning:** Learning pathways are personalized routes for learners to acquire knowledge and skills. This individualized approach allows for flexibility and adaptation to diverse learning styles, interests, and goals. This aspect is crucial for evaluating training

courses because it acknowledges the uniqueness of each learner and enables assessment based on how well the course aligns with their specific needs.

2. **Self-Assessment and Reflection:** Learners are encouraged to evaluate their progress, adjust their goals, and refine their learning pathways based on their experiences. This emphasis on self-assessment and reflection is essential for evaluating training courses in terms of participant satisfaction. Courses that facilitate self-assessment and reflection are likely to be more engaging and effective, leading to higher participant satisfaction.
3. **Modular Structure and Proficiency Levels:** The CYRUS learning pathways are designed with a modular structure and different levels of proficiency, allowing for upskilling and reskilling. This approach enables participants to progress through the training according to their existing knowledge and skills, as well as their learning objectives. The methodology for designing these pathways involves skills assessment, tailored learning offers, and validation of acquired skills, providing a framework for evaluating training courses.
4. **Alignment with Competence Framework:** The learning pathways are aligned with the CyberSecComp, which defines the knowledge and skills required for different professional roles. This alignment ensures that training courses are relevant to the specific competencies needed in the industry sectors targeted by CYRUS. Evaluating training courses against the competence framework can assess their effectiveness in addressing skill gaps and meeting industry needs.
5. **Flexible and Tailored Training:** The methodology for designing learning pathways emphasizes flexibility and tailoring to specific target groups, professional roles, and industry sectors. Training courses should be adapted to meet the needs of diverse learners and ensure the transferability of acquired knowledge and skills to the workplace. Evaluation criteria should include the extent to which training courses are customized to the requirements of different learners representing TM sectors.

In conclusion, the outputs of D1.2, particularly the CyberSecComp and the CYRUS learning pathways, provide a solid basis for designing and evaluating cyber security training courses. By identifying the necessary competences, guiding course development and promoting personalised learning, these results make a significant contribution to the design of training programmes tailored to specific target groups, ensuring that the information and skills acquired are transferable to the workplace.

2.3 KPI's for evaluating the training impact

The following KPIs will be used for evaluating the impact of the training courses:

- number of courses provided and listed on the Digital Skills and Jobs Platform,
- number of courses delivered, number of applications received per course,
- number of selected participants,

- number of participants that have successfully completed the course,
- number of certifications/diplomas issued (if applicable),
- number of SMEs, whose staff have benefited from the courses,
- number of participants that have rated the courses as satisfactory in terms of teaching and learning methods.

Dedicated strategies and tools will be used to monitor and evaluate the achievement of the KPIs.

Table 3 List of Key Performance Indicators

KPI	Strategy/tool	Responsible partner
Number of courses provided and listed on the Digital Skills and Jobs Platform	Training offer template provided by Digital Skills and Jobs Platform	EITM/DBL
Number of courses delivered, number of applications received per course	Registration form	SLAB, training providers
Number of selected participants	Registration form	SLAB, training providers
Number of participants that have successfully completed the course	Post- Training Assessment Test and certification	Training providers
Number of certifications/diplomas issued	Certificates issued by ODOO tool	Training providers
Number of SMEs, whose staff have benefited from the courses	Post- assessment analysis Training Satisfaction Survey Structured Interview Questionnaire	Training providers, Industry Partners (if applicable)
Number of participants that have rated the courses as satisfactory in terms of teaching and learning methods	Training Satisfaction Survey	Training providers

KPIs will be constantly monitored throughout the delivery of the training courses (pilot and final delivery). Results will be reported at different stages of the delivery process, namely M24 (D3.6 - Report on training assessment intermediate) and M36 (D3.7 - Report on training assessment Final).

3 Evaluation Methodology

For the purpose of this document and in order to standardise the terminology used in the project, we want to emphasise from the outset the difference between **evaluation** and **assessment**.

The terms are often used as synonyms, but in fact they are distinct and different. The purpose of assessment is to measure effectiveness; while evaluation adds an element of value to the process. We therefore assume that in the methodology described below, assessment is part of the evaluation process, where evaluation is a holistic process carried out through specific methods and measurement tools.

3.1 Overview of existing training evaluation methods

The CYRUS consortium knows that in the field of cyber security, the threat landscape is constantly evolving, so the effectiveness and appropriate selection of training courses is of paramount importance. In order to appropriately validate the selection, it is crucial to choose the right training evaluation method so that the feedback allows CYRUS Partners to adjust and improve the post-pilot activities.

Using a top down and a bottom-up approach, it has been established that there are different methods for evaluating these programmes, each with its own strengths and limitations. Some of the most effective methods are [2]:

1. **Kirkpatrick Model:** A four-level evaluation framework focusing on reaction, learning, behavior, and results.
2. **Phillips ROI Model:** An extension of the Kirkpatrick Model, adding a fifth level to measure the return on investment (ROI).
3. **CIPP Model (Context, Input, Process, Product):** A comprehensive evaluation framework focusing on context, input, process, and product.
4. **Brinkerhoff's Success Case Method:** A qualitative approach identifying the most and least successful cases to understand the impact of training.
5. **New World Kirkpatrick Model:** An enhanced version of the traditional Kirkpatrick Model, integrating modern training needs and emphasizing strategic alignment and continuous improvement.

Due to the time constraints of the project, choosing a suitable and effective method was challenging. After considering all possibilities, the **New World Kirkpatrick Model** was selected as the most appropriate because of its structured, well-established approach, which suits the project's needs while at the same time allowing the necessary adaptations towards CYRUS goals. Its advantages lie in its **holistic and continuous approach, with a stronger focus on real-world application, behavior change, and results within the context of organizational culture and support systems**. At the same

time, the main approach that the CYRUS project wants to emphasize is **user-oriented** training evaluation methodology which aligns perfectly with the approach of the New World Kirkpatrick model. A user-oriented training evaluation methodology focuses on the needs, experiences, and outcomes of the trainees. This approach emphasizes the practical application and impact of training from the perspective of those who participate in it.

How the New World Kirkpatrick Model is adapted to the CYRUS project is described in the following chapters.

3.2 The New World Kirkpatrick Model and how it fits into CYRUS

Selecting the New World Kirkpatrick model for evaluating training methodology offers several distinct advantages. It builds upon the original Kirkpatrick framework (see Figure 1), providing a widely recognized and stable methodology, ensuring credibility and acceptance among stakeholders. This model emphasizes the importance of assessing training at multiple levels: reaction, learning, behavior, and results, offering a comprehensive evaluation approach.

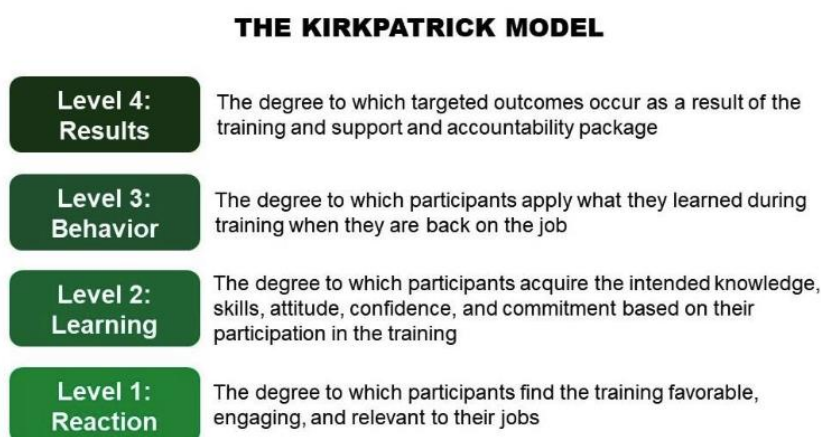


Figure 1 The Kirkpatrick Model [3]

One of the key features of the New World Kirkpatrick model is its focus on aligning training outcomes with organizational goals, ensuring that training efforts directly contribute to business objectives. Additionally, it incorporates modern principles such as the importance of reinforcement and sustainability, highlighting the need for ongoing support and follow-up to maximize training effectiveness (see Figure 2).

THE NEW WORLD KIRKPATRICK MODEL

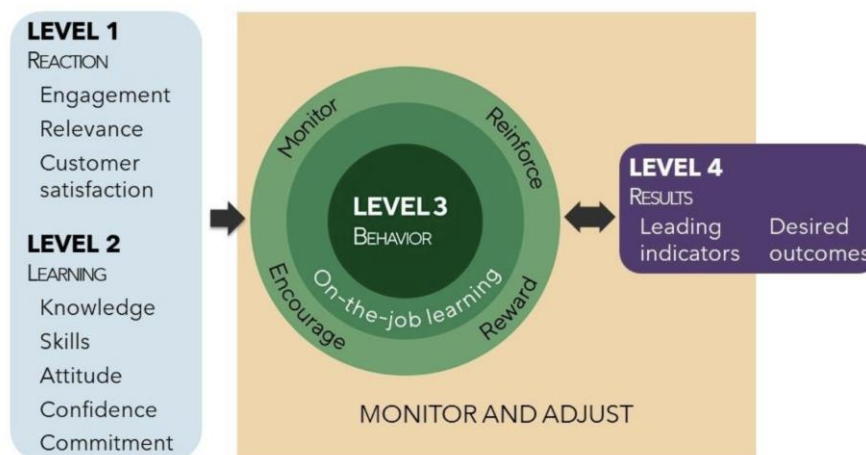


Figure 2 New World Kirkpatrick Model [3]

Furthermore, its iterative nature supports continuous improvement, crucial for evolving needs. By regularly reassessing and refining training programs based on feedback and results, CYRUS training providers can ensure that their training remains relevant and impactful. The New World Kirkpatrick model is also ideal for evaluating tailor-made trainings. Its flexibility allows it to tailor the assessment criteria to the specific goals and context of each training initiative. A planned evaluation based on this methodology will give an answer to the question of whether the training objectives based on Learning outcomes from D1.2 and Learning objectives from D2.1 have been achieved.

As mentioned above, New World Kirkpatrick's model evaluates the effectiveness of training on four levels, which are described below. Each has been analyzed in terms of the project's capabilities and constraints and thus tailored to meet the needs of CYRUS.

LEVEL 1 Reaction: Measures participants' immediate response to the training.

Focus: assess the relevance and overall satisfaction of participants.

Emphasis: Going beyond simple satisfaction to understand how engaged participants were and how relevant they found the training content to their work.

Metrics used in CYRUS: Training satisfaction survey (satisfaction scores, trainer effectiveness ratings).

LEVEL 2 Learning: Evaluate the extent to which participants have acquired the intended knowledge, skills, and attitudes from the training.

Focus: Test knowledge retention and skill acquisition through assessments and practical exercises.

Emphasis: Emphasize not only knowledge gain but also attitude, confidence and commitment to applying what they've learned on the job.

Metrics used in CYRUS: Pre- and Post-Training Assessments (measure knowledge gain); Pre- and post- Self-Assessment (measure confidence levels and commitment to apply learning); Skills Demonstration (Practical exercises on cyber-range platform).

LEVEL 3 Behavior: Determine whether participants are applying what they learned during training when they are back on the job. It has three components: critical behaviors, required drivers, and on-the-job learning.

Focus: Observe changes in behavior and performance.

Emphasis: Recognize that behavior change requires ongoing support and reinforcement. Identify and address barriers to application, provide follow-up support, and ensure a conducive work environment for behavior change.

Metrics used in CYRUS: Post-hoc assessment (follow-up test to measure knowledge and skill retention), Interviews (whether knowledge and skills gained are used at work).

LEVEL 4 Results: Assess the ultimate impact of the training on organizational goals and outcomes.

Focus: measure the tangible outcomes such as increased productivity, quality improvements, and higher customer satisfaction.

Emphasis: Link training outcomes directly to key organizational metrics and strategic goals. Engage stakeholders to ensure that training initiatives are aligned with and contribute to overall business success.

Metrics used: Financial Metrics (Return on Investment); Productivity Measures; Quality Indicators (reductions in error rates, improvements in quality scores).

We propose not to measure this level in the project, which is justified by:

- The high number of people to be trained (>5,000) results in a complicated selection of participants, limited contact with superiors and their cautious and secretive attitude towards financial topics, which prevents the implementation of level 4.

Focusing on the first three levels provides a practical and effective method for evaluating the CYRUS training courses. By systematically assessing participants' immediate reactions and measuring their knowledge and skill gains, training providers can gather valuable insights into the effectiveness of their training programs. In addition, post-hoc assessments will examine whether knowledge and skills are being used in the workplace and help to understand to what extent participants and their companies benefited from the training. This streamlined approach allows for timely adjustments and improvements, ensuring that cyber security training remains relevant, engaging, and impactful.

3.3 Summary of the CYRUS training evaluation methodology

The evaluation vision in the CYRUS project is centered on creating a comprehensive and adaptive framework to evaluate and enhance cybersecurity training effectiveness. This vision involves developing a **portfolio of tools** that connect learning outcomes with increasing learner autonomy, facilitating transitions from education to work by aligning skills with the TM Companies' needs and market demands, and the development of **training evaluation method**. The assessment tools will continuously monitor skill progression, comparing initial levels with subsequent performance to tailor training accordingly. An overarching evaluation strategy will enable self-assessment for all participants, including managers, trainees, and industry stakeholders. This strategy will collect **quantitative and qualitative** data to validate the implementation experience, identify improvement areas, and promote dialogue between training providers and industry associations for ongoing enhancement of the training offer.

Learning outcomes, formulated on the basis of a **Competence Framework**, will guide the design of educational pathways and tailored assessment methods. Training activities will be evaluated through questionnaires and qualitative research to assess teaching methodologies, delivery effectiveness, and developed competences, gathering suggestions for future improvements. The evaluation methodology will include tools such as entry and final knowledge tests and survey to evaluate participant satisfaction and knowledge improvement. Preliminary evaluation of **pilot training** modules will involve stakeholders from different sectors to collect feedback, while **formal post-hoc assessments** will analyze the training's impact in the workplace through self-evaluation and qualitative methods. This will allow us to monitor i) number of SMEs, whose staff have benefited from the courses, ii) the number of people reporting an improved employment situation after the end of the training supported by the programme, iii) knowledge and skill retention. Sector-specific recommendations will be defined based on evaluation, optimizing training modules with input from SMEs and stakeholders to address sectoral needs.

3.3.1 CYRUS training evaluation method

Overall, the CYRUS evaluation vision emphasizes skill progression, alignment with market needs, stakeholder involvement, comprehensive data collection, iterative improvement, and customized learning pathways, creating a robust and responsive framework for cybersecurity training evaluation and enhancement. The CYRUS training evaluation method will be used in the pilot and then adapted and used in the final training courses. It includes (see Figure 3):

BEFORE TRAINING

1) **Selection of the best fitting training course**

- The participant, using the Competence Framework and Learning Pathways developed by CYRUS, chooses training. The course description will guide prospective participants, by demonstrating the minimum knowledge level needed to enter the course.

DURING TRAINING

Immediately before training

2) **Pre-Test** (consisting of 2 parts):

a) Pre- Training Assessment (**Level 2**)

- Measures the level of knowledge of participants prior to the course. Refers to all courses offered by CYRUS (the template demonstrated in **Annex 2** will be applicable to all courses, excluding Cyber Ranges training, where the entry level of knowledge is defined as “0”, in respect to the specific nature of the cyber range environment and simulations planned).

b) Pre- Self-Assessment (**Level 2**)

- Self-reported confidence in existing skills or knowledge.
- Attitude control, defined as the degree to which trainees believe that it will be worthwhile to implement at work what they will learn during training.

During training

3) **Practical Exercises (Level 2)**

- Demonstration of acquired skills through practical exercises on cyber-range platforms. Cyber range platform is described in section 4.2.5 *Formats and use of Cyber range platform*. Main training modules, despite different formats, will offer practical exercises on cyber range platform. Training providers will receive the reports on how the participant performed in practical exercises.

Immediately after training

4) **Post-Test** (consisting of 2 parts):

a) Post- Training Assessment (**Level 2**)

- Measures the participants' level of knowledge after the course. Refers to all courses offered by CYRUS (the template demonstrated in **Annex 3** will be applicable to all courses, excluding those offered by Cyber Ranges as the nature of the training in cyber range environment requires dedicated post-test related to the practical exercises performed and incorporated in the cyber range platform. The results of the post-training assessment will be distinguished depending on the course format).

b) Post- Self-Assessment (**Level 2**)

- Self-reported confidence in applying new skills or knowledge.
- Participants' expressed intentions to apply what they've learned.
- Participants' expressed attitude defined as the degree to which trainees believe that it will be worthwhile to implement what they have learned during the training at work.

5) **Training satisfaction survey (Level 1)**

- Carried out immediately after completion of training (the template demonstrated in **Annex 1** will be applicable to all courses with relevant adjustments if needed).
- Evaluation of training relevance: its content, participants' satisfaction with the training course and the trainer effectiveness.

2 MONTHS AFTER TRAINING

6) Post-hoc assessment (Level 3) (applies only to the course in final delivery)

a) Follow-up Test

- Follow-up test asking participants how often they apply the new skills or knowledge (to measure the knowledge and skills retention). Refers to all courses offered by CYRUS. The template demonstrated in **Annex 4** will be applicable to all courses, excluding those offered by Cyber Ranges. The nature of the training in cyber range environment (focused on particular scenarios) do not correspond with follow-up test.

b) Interviews (Level 3)

- with selected participants (representing key stakeholders in Transport and Manufacturing sectors) about whether the employment situation has improved and whether they apply what they learned during training when they are back on the job. The template is demonstrated in **Annex 5**.
- (if available) with employers about changes in participants' behavior and about benefits that SMEs personnel experienced by enrolling to the CYRUS training. Training providers will try to reach managers of SMEs, in case companies register a large number of participants for selected courses (the registration form allows participants to be registered by the companies' HR departments). The template is demonstrated in **Annex 6**.

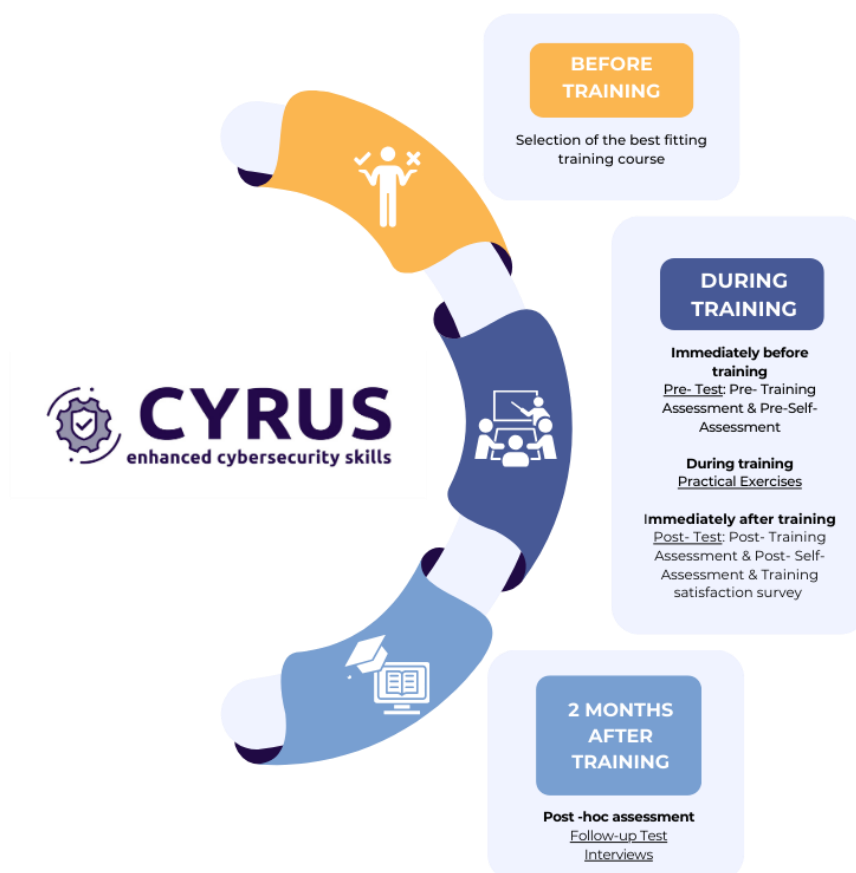


Figure 3 CYRUS training evaluation methods

Leveraging multiple methods of evaluating training effectiveness is essential in accurately assessing the effectiveness of training courses. Combining different approaches allows for a more comprehensive understanding of how the training has impacted participants and the organisation. Here are the key methods to consider in the CYRUS project:

- a. **Quantitative Methods.** These methods focus on measurable data and often involve pre-and post-training assessments. For instance, tests or quizzes can be administered to evaluate the knowledge gained.
- b. **Qualitative Methods.** These involve gathering non-numerical data, such as participant feedback and opinions. Methods include surveys, interviews, and focus groups. This type of evaluation provides insights into the participants' perceptions of the training, its relevance, and areas for improvement.

It is important to note that measuring training effectiveness is an ongoing process that requires a combination of quantitative and qualitative methods. Using a combination of these metrics can provide a comprehensive assessment of training effectiveness, allowing training administrators to make data-driven decisions and continuously improve their courses to meet learning objectives.

ANALYSIS OF THE RESULTS

1) Data Analysis

a) Pre- and Post-Tests

- Compare Pre- and Post- Training Assessment results to measure knowledge gain. After two months, comparison of results with the Follow-up test
- Review Pre- and Post- Self-Assessment responses to identify common areas where participants feel less/more confident.
- Development of training satisfaction results. In the pilot phase, implementation of improvements to training during optimization process. At the final delivery stage, recommend improvements in future courses in the TM sectors.

c) Practical Exercise

- ongoing documentation of the participants' level of knowledge during the training

2) Reporting

a) After the pilot delivery M24

- Compile the results of the assessments and implement potential improvements to the training evaluation methodology and the training delivery and content itself. The result will be described in D3.2 Report on the pilot delivery of short-term training courses and D3.6 Report on training assessment intermediate.

b) After completion of trainings (final delivery) M36

- Create a report summarizing the results of the assessments.
- Highlight the overall improvement in knowledge and skills among participants.
- Identify specific topics or skills that may require additional training or reinforcement.
- Provide recommendations for future training sessions based on the assessment data.
- All results will be described in deliverables planned for M36 (D3.3 & D3.4 & D3.5 & D3.7) and in the Final Periodic Report, as parts of the results may occur after the end of the project.

3.3.2 Training assessment tools

Based on the above CYRUS training evaluation methodology, the CYRUS project will use a user-oriented approach for both pilot and final delivery. The CYRUS portfolio of training assessment tools will include tools for ongoing assessment of participant progression and learning during and after the training. These will be developed to a) understand the difference between initial skill level and trainees' performance at other times and b) be able to adjust training levels and work-based activities according to the needs of individuals, following their development reviews at different measurement points.

The following assessment tools shown in Table 4 will be used to 1) measure participants' immediate response to the training, 2) evaluate the extent to which participants have acquired the intended knowledge, skills, and attitudes from the training and 3) determine whether participants are applying what they learned during training into practice.

Table 4 Portfolio of CYRUS training assessment tools

When	What	Tool
Before the training	Selection of training course and registration process	Course catalogue
During the training	Pre- assessment	Pre- Training Assessment Test including self-assessment
	Practical exercises	Reports on performance generated by Cyber Ranges platform
	Post- assessment	Post- Training Assessment Test including self-assessment
Training Satisfaction Survey		
2 months after the training	Post-hoc assessment	Follow-up Training Assessment Test including self-assessment
		Interviews including Interviews Questionnaire

- a. **Pre- Training Assessment Test** for entry level to measure the level of knowledge and skills of participants during the course, as well as a self-assessment of their confidence in existing skills or knowledge, and an attitude control to implement what they learned during the training at work.
- b. **Post- Training Assessment Test** for final level to measure the knowledge and skill improvement after the training course, as well as a self-assessment of their confidence in applying new skills or knowledge into practice and the attitude whether it is worth implementing at work what they have learned during the training.
- c. **Training Satisfaction Survey** carried out immediately after completion of training course to evaluate the training relevance: its content, participants' satisfaction with the training course and the trainer effectiveness.

- d. **Follow-up Training Assessment Test** carried out 2 months after completion of training course to assess the knowledge and skill retention.
- e. **Interviews Questionnaire** carried out 2 months after completion of training course as an additional qualitative data collection tool for evaluation to follow-up other methods.

All the above training assessment tools derived from Levels 1, 2 and 3 of New World Kirkpatrick model of evaluation. These tools will be implemented in the CYRUS project using the SLAB platform - CRM tool Odoo and in case of the training offered by Cyber Range - cyber range platform. SLAB platform is described in section 4.1.4 Tool supporting Pilot delivery. Cyber range platform is described in the section 4.2.5.

3.3.2.1 CYRUS Pre-, Post- and Follow-up Training Assessment Tests

One fundamental aspect of training effectiveness is determining whether participants have gained the necessary knowledge and skills. Pre-, post- and post-hoc training assessments examine the improvement in participants' knowledge and skills before and after the training, as well as whether knowledge and skills are being used in the workplace. Participants will be able to see their own growth and development, which can motivate them to continue learning more. Additionally, these assessments help to identify areas where further support or reinforcement may be required and guide future training initiatives to address specific needs and gaps.

In the CYRUS training courses, these types of pre-, post- and post-hoc assessment will have the form of tests, with closed-ended questions, that must be completed by trainee depending on the training content. The Pre- Training Assessment Test helps identify any knowledge gaps, areas of weakness, or existing proficiency among participants. On the other hand, the Post- Training Assessment Test evaluates participants' understanding of the training content, their ability to apply the newly acquired knowledge, and their overall skill development. The Follow-up Training Assessment Test will be carried out 2 months after completion of the training course to assess the knowledge and skill retention.

In addition, the CYRUS assessment methodology also includes **Pre- and Post- Self-Assessment** of participants in order to assess how they rate their level of knowledge and skills in the subject matter of training course, as well as to identify areas of confidence or uncertainty; where participants feel less/more confident. Following the user-oriented approach, Pre-and Post-Self Assessment are incorporated into Pre-and Post-Test so as not to bother participants with too many tests. Templates of CYRUS Pre-, Post- and Follow-up Training Assessment Tests are attached to this document as **Annex 2, Annex 3 and Annex 4**.

These three aforementioned tools (pre-, post- and follow-up tests) do not apply to training conducted under the Cyber Ranges platform.

3.3.2.2 CYRUS Training Satisfaction Survey

The satisfaction survey gives participants the opportunity to express their opinions and evaluate various aspects of the training course, such as those related to training materials, methods, and the trainer, as well as how the knowledge and skills gained during the training will be useful to them in their professional work and allow them to apply into practice. Participants can also provide suggestions for future improvements to the CYRUS training courses.

The CYRUS Training Satisfaction Survey is more elaborate, as it focuses on the training content and activities and examines whether the training is sufficiently personalised and tailored to the participant's personal and professional needs. It consists of a set of open and closed-ended questions designed to gather valuable qualitative and quantitative information from participants, capturing their in-depth opinions about the relevance, usefulness and applicability of the training content, the achievement of training objectives, as well as the evaluation of the training methods used. The items used to assess trainees' satisfaction were taken from the scale "Motivation for Training Scale" developed by Noe and Schmitt [4]. This scale is a five-point Likert-type scale (1=Strongly Disagree and 5=Strongly Agree).

In general, a satisfaction survey is the most commonly used method for training evaluation. Actively involving participants in the evaluation process shows a commitment to their continuous improvement and ensures that the training courses meet their needs and expectations. A template of CYRUS Training Satisfaction Survey is attached to this document as **Annex 1**.

3.3.2.3 CYRUS Interviews Questionnaire

Knowledge is valuable when it can be practically applied in the workplace. An interview is a method of asking quantitative or qualitative questions that involves conducting intensive individual interviews with a small number of respondents to explore their subjective perceptions, insights, attitudes and experiences. Interviews are useful for gathering subjective perspectives from respondents.

Interviews conducted in the evaluation of CYRUS training courses include qualitative questions, which are open-ended and allow the respondent to provide a response in his or her own words. The main aim of this method is to gather information on whether the employment situation of participants has improved and whether they apply what they learned during training into practice. There are three approaches to qualitative interviews that vary in their level of structure and can be combined [5]:

1. **Structured interviews** are most typically used in quantitative investigations, including survey research. In structured interviews, the interviewer presents the interviewee with a standardized set of questions, often in questionnaire form. These questions usually have pre-set answers from which the interviewee selects, rather than 'open-ended' questions. Each individual interview features the same set of questions, asked in a fixed order. All questions included in

the research design are asked in each interview session. Structured interview questions are the most common type used in surveying interviewing.

2. **Semi-structured interviews** center around a mixed framework of general themes and pre-established questions, which can be adapted in the context of individual sessions. The interviewers are thus free to leave certain questions out, mix the order of questions, or ask certain standard questions in different ways depending on context. Semi-structured interviews also rely on a combination of both open and closed questions.
3. **Unstructured interviews** – also known as ‘informal’ or ‘conversational’ interviews – are wholly qualitative, and include only topic areas and themes rather than standard questions. Unstructured interviews take the form of natural conversation between two or more people, and allow the interviewer to pursue follow-up questions or new lines of discussion as they see fit. Closed questions are avoided, and the interviewee is often asked to identify the information they feel is most important for the discussion.

It was decided that structured open-ended interviews will be conducted with participants, and the number of people to be interviewed will be determined each time, depending on the number of potential participants and available resources. The Consortium Partners will try to reach participants/key stakeholders from each Consortium country. In addition, depending on the possibilities, interviews with employers about changes in participants’ behavior and benefits that SMEs personnel experienced by enrolling to the CYRUS training will be conducted. Training providers will try to reach managers of SMEs, in case companies register a large number of participants for selected courses (the registration form allows participants to be registered by the companies’ HR departments). Templates of CYRUS Interviews Questionnaires are attached to this document as **Annex 5** and **Annex 6**.

Overall, the main source of the evaluation of CYRUS courses will be data gathered from the tests and surveys and this analysis will be supported by other qualitative methods e.g. interviews with some selected participants and employers, if possible. Interviewing is a useful way to follow-up with questions to integrate the results collected through the surveys with qualitative feedback from the participants and allow for the assessment of participants’ competency, accuracy, and efficiency in performing tasks related to the training course. It also offers real-time feedback to participants, allowing them to make immediate adjustments and improvements in their performance. Overall, interviews after the training examine the practical application of participants’ acquired knowledge and skills in real work situations. This method provides valuable insights into participants’ actual performance and the impact of the training on their professional roles.

4 Plans to validate and deliver the short-term training courses

The delivery of short-term training courses must be carefully planned so that the entire effort related to the design of the training modules will translate into the educational success of participants, fully satisfied with the training experience offered by CYRUS. Therefore, an agile Delivery Plan is needed to sequence the work, considering the project team's capabilities, and to meet projects objectives within the project time frame given.

The Delivery Plan will guide all consortium partners in collaboration, using their most relevant resources and experience in order to validate training modules developed (under WP2) and ensure their highest quality in terms of effectiveness of proposed teaching methodology as well as the delivery at the final stage of the project.

The delivery plan is guided by the following principles:

- it targets mainly SMEs' and TM enterprises employees at all levels - (e.g.: new entrants building the required competences, professionals and managers improving and upgrading their expertise) with the focus on Transport and Manufacturing sectors and different roles within the organisations;
- it makes cybersecurity training available in one-stop shop offer across EU;
- it is realistic and effective - plans activities with a view to maximizing impact while using partners' resources effectively;
- it is flexible – provide flexibility in engagement formats and delivery methods to accommodate diverse learning styles, schedules, and resource constraints. CYRUS training providers (DBL, SLAB, CEF, CR, PPHS) follow companies' and users' needs and are ready to adapt whenever it is feasible.

Accordingly the overall Delivery Plan of the CYRUS short-term training courses splits into two parts:

I. Pilot delivery Plan

II. Final delivery Plan

As the aims of those two, mentioned above, parts differ to some extent, this document describes them in two separate sections, elaborating in detail a sequence of subsequent actions needed.

4.1 Pilot delivery plan

4.1.1 Scope and objectives

The Pilot Delivery of the short-term training courses (developed under WP2) is a validation activity and a core element of the quality process. The pilot delivery will test both the theoretical, as well as practical parts of the training, enhancing the effectiveness of its final versions (to be delivered in WP3). This first delivery will be undertaken to collect feedback from the representatives of Transport and Manufacturing sectors and help the fine-tuning of the training packages. Additionally, pilot delivery will also gather feedback on the assessment process itself allowing for improvements to be made in the final assessment/evaluation phase. Therefore, **the main objective of the Pilot Delivery Plan is to support coordination of the preliminary assessment of the test version of the training sessions and collect feedback from the participants to refine and improve the training courses.**

During the Pilot Delivery **29 training courses** on technical and non-technical skills will be available for testing and providing feedback. The list of the training modules intended for testing (shown in Table 5) is a result of the works carried on under WP2 and based on the Cybersecurity Competence Framework developed in WP1, in terms of training topics, learning outcomes and key training objectives, profiles in each of the industrial domains etc. The full pilot training catalogue is available online at [CYRUS website](#). The number of training courses proposed at the pilot stage significantly exceeds the amount originally planned at the proposal stage, which proves the commitment of the project team to respond to the needs of each sector even though it brings more challenges in terms of e.g. logistics, dissemination activities etc. Different formats available determine that pilot sessions will be organised as separate events dedicated to achieve particular learning outcomes (based on the D1.2) rather than separate sectoral/national events. Such an approach will still allow consortium to gather valuable feedback from sectoral organisations and at the same time assess if the training has achieved its goals. The number of deliveries of each course available for pilots will depend on the interest shown by prospective participants during the registration process. Lack of interest in a particular course will result in a course cancellation and will also serve as valuable feedback in terms of sectoral training needs.

Table 5 List of the training modules available for Pilot Delivery

Lp.	Partner name	Course(s) Name	Available for pilot in 2024	Available format
1	CYBER RANGES	IR: Preparation Phase	July-Oct	Online self-paced
2	CYBER RANGES	IR: Detection and Analysis	July- Oct	Online self-paced

3	CYBER RANGES	IR: Containment, Eradication and Recovery	July- Oct	Online self-paced
4	CYBER RANGES	IR: Post Incident Activity	July- Oct	Online self-paced
5	CYBER RANGES	Introduction to DevSecOps	July - Oct	Online- self-paced
6	CYBER RANGES	Introduction to DevSecOps	July - Oct	Online self-paced
7	SEARCH-LAB	OWASP TOP 10 Part 1	10th of July 9:00-13:00	Online - instructor led
8	SEARCH-LAB	OWASP TOP 10 Part 2	11th of July 9:00-13:00	Online - instructor led
9	SEARCH-LAB	OWASP TOP 10 Part 3	7th of August 9:00-13:00	Online - instructor led
10	SEARCH-LAB	OWASP TOP 10 Part 4	9th of August 9:00-13:00	Online - instructor led
11	SEARCH-LAB	Security testing Part 1	22nd of August 9:00-13:00	Online - instructor led
12	SEARCH-LAB	Security testing Part 2	9th of September 9:00-13:00	Online - instructor led
13	SEARCH-LAB	Network security and secure communication	23rd of September 9:00-13:00	Online - instructor led
14	SEARCH-LAB	Public Key Infrastructure	2nd of October 9:00-13:00	Online - instructor led
15	PPHS	Introduction to Cybersecurity	2nd of September (launching e-learning) 2nd of September	Online - instructor led (PL), on-site (PL), e-learning (EN, PL)

			9:00-13.00 CET (on site) 3rd of September 9:00-13:00 CET (online)	
16	DBL	Cybersecurity culture & Human Behaviour - Introduction (for Administrators)	9th September time TBC	Online - instructor led
17	DBL	Cybersecurity culture & Human Behaviour - Intermediate (for Administrators)	13th September time TBC	Online - instructor led
18	DBL	Cybersecurity culture & Human Behaviour - Introduction (for Operators)	16th September time TBC	Online - instructor led
19	DBL	Cybersecurity culture & Human Behaviour - Intermediate (for Operators)	23th September time TBC	Online - instructor led
20	CEFRIEL	Personal and corporate cyber hygiene (for Administrators)	9 September 2024, 14:00 - 17:00 and 11 September 2024, 14:00 - 17:00	Online - instructor led
21	CEFRIEL	Personal and corporate cyber hygiene (for Operators)	12 September 2024, 14:00 - 17:00 and 13 September 2024, 14:00 - 17:00	Online - instructor led

22	CEFRIEL	Personal and corporate cyber hygiene (for Engineers)	25 September 2024, 14:00 - 17:00 and 26 September 2024, 14:00 - 17:00	Online - instructor led
23	CEFRIEL	Today's Information Security (for Administrators)	2 September 2024, 14:00 - 17:00	Online - instructor led
24	CEFRIEL	Today's Information Security (for Operators)	5 September 2024, 10:00 - 13:00	Online - instructor led
25	CEFRIEL	Today's Information Security (for Engineers)	19 September 2024, 14:00 - 17:00	Online - instructor led
26	CEFRIEL	The evolution of Social Engineering, exposure and protection of digital identity, personal and corporate (for Administrators)	3 October 2024, 10:00 - 13:00	Online - instructor led
27	CEFRIEL	The evolution of Social Engineering, exposure and protection of digital identity, personal and corporate (for Operators)	7 October 2024, 10:30 - 13:30	Online - instructor led
28	CEFRIEL	The evolution of Social Engineering, exposure and protection of digital identity, personal and corporate (for Engineers)	8 October 2024, 10:00 - 13:00	Online - instructor led
29	CEFRIEL	Threat analysis, Threat Landscaping and Threat modeling	14 October 2024, 14:00 - 17:00	Online - instructor led

The courses proposed for the pilot delivery are organized into tracks (see Figure 4 below). The basic track will be recommended in the registration process as a starting point unless the participant rates his or her knowledge as more advanced. The TRK 1 focuses on human-related security, while TRK 2, which has two specialisations (TRK 2.1 and TRK 2.2), delves into cyber risk. The tracks suggested below are

designed to prepare the ground with basic knowledge and supply with immediately actionable competences.

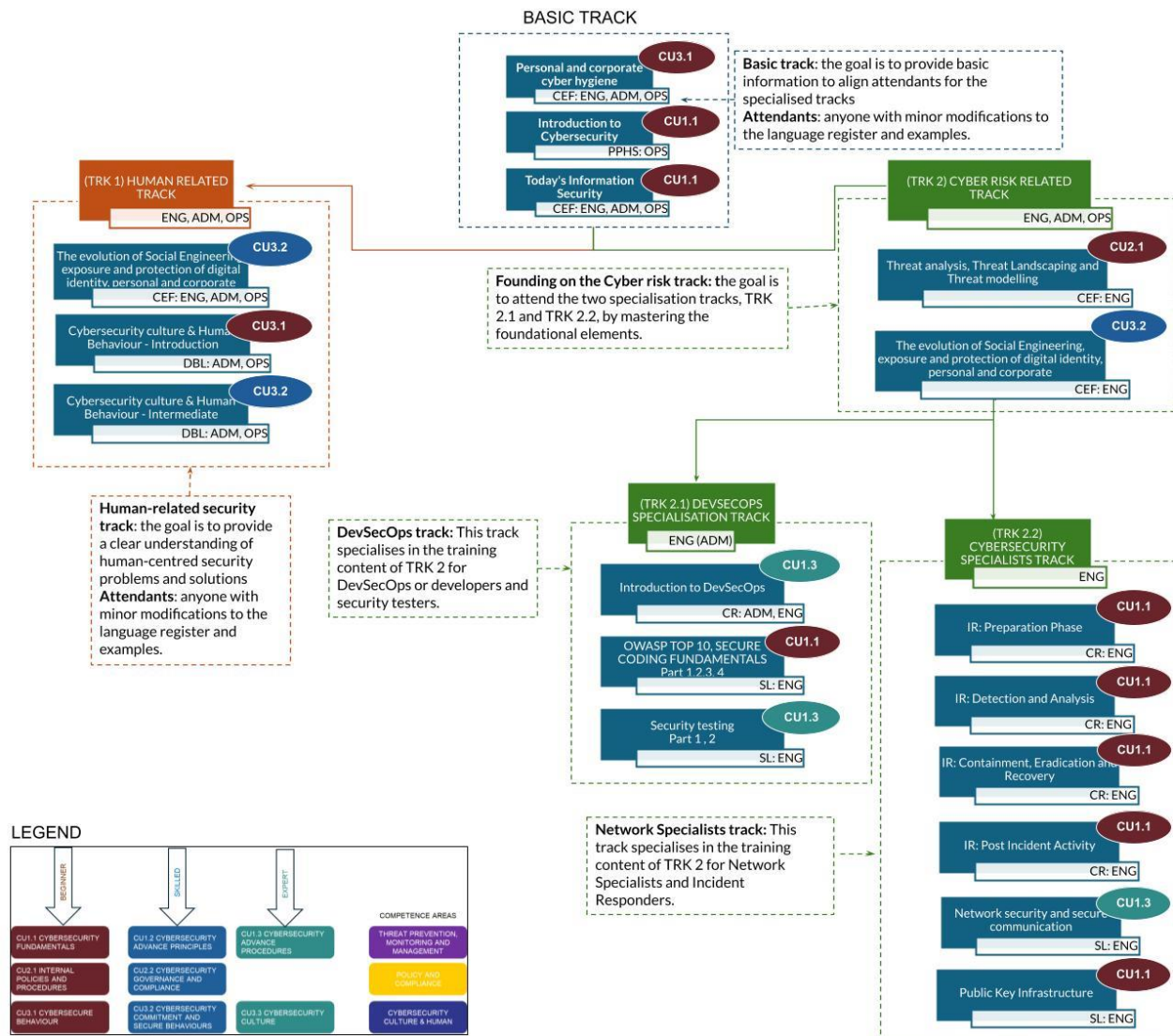


Figure 4 Pilot Delivery Training Tracks

4.1.2 Roles and Responsibilities

Each of the consortium partners have a vital role to play in the pilot delivery. The overall coordinator of the Pilot delivery across the Transport and Manufacturing sector is WP3 and T3.2 leader – SEARCH-LAB.

Providing pilot sessions

Training providers' partners i.e.: PPHS, CyberRanges, Cefriel, Deep Blue and SEARCH-LAB are responsible for providing pilot session events, in accordance with the above Table 5. Flexible approach to the Pilot Delivery Plan results in readiness to offer different formats and delivery methods according to the target audience involved. Taking into account main findings from D1.2 and D2.1, as well as results of additional survey conducted in M17 by WP3 leader (targeted at the prospective participants), most of the training in the pilot phase will take place online (including cyber ranges activities), which defines the scope of responsibilities of each partner. Additionally, the on-site training format for selected courses will be available with the several slots offered by the training providers upon the demand and with respect to the training providers' capacity. The overarching principle adopted in the Pilot training delivery Plan is that the partner, providing the training, is responsible for its overall organization (including all logistics, provision of trainers and training materials etc.) and carrying out assessment activities within the support of the Odoo CRM tool described in section 4.1.4. SEARCH-LAB team as a Leader of T3.2 (Pilot Delivery) will be the main contact point, distributing among other relevant partners, all prospective participants' queries, regarding pilot training courses.

Gathering participants for pilot delivery

CYRUS business and professional associations partners i.e.: EITM, ITKAM, UIC, EWF, LIC and EPHIAL are responsible for disseminating information about CYRUS pilot sessions in their business environments and bringing participants for the training pilot events planned.

Each of the partners mentioned above has prepared a draft strategy in order to reach and recruit participants for the pilot delivery:

- a) EWF - will conduct targeted awareness campaigns: contact its members as well as industrial organisations/associations in its network of contacts at European level through direct communications, in particular through the use of email, phone and newsletters, informing them about the training opportunities available during the CYRUS pilot phase. EWF will be also present in Industry events and webinars: as an example in the following month EWF will participate on the 7th IIW Annual Assembly and International Conference on Welding and Joining, 7-12 July 2024, Rhodes, Greece where the training catalogue will be presented (a QRC will be available allowing in time registrations), and flyers distributed. The EWF will develop and disseminate the training catalogue and the link to register through its social networks and newsletters in order to reach a greater number of companies and registrations. EWF will capacitate internal staff (25 participants) in order to prepare their trainers to replicate the beginner level Cybersecurity training courses to EWF Members (ANB/ATB) in several countries out of the consortium (Romania, Portugal, Denmark, Spain). In the first weeks of July EWF will

contact at least 5 partners organisations from Portugal, Romania, Denmark, Spain and Italy) to be part of the pilots. 36 trainees, from different organisations, linked to EWF are already interested in CYRUS pilot training and distributed for the following courses in September and October.

Table 6 EWF courses for pilot delivery

Topic	Brief Description	Profile	Date	Time	Duration (H)
1. Personal and corporate cyber hygiene	Best practices to identify main cyber threats and reduce cyber risk	ADM	09/09 + 11/09	14.00-17.00	6
		OPS	12/09 + 13/09	14.00-17.00	6
		ENG	25/09 + 26/09	14.00-17.00	6
2. Today's Information Security	Introduction to the current cybercrime and cyber security scenarios	ADM	02/09	14.00-17.00	3
		OPS	05/09	10.00-13.00	3
		ENG	19/09	14.00-17.00	3
3. The evolution of Social Engineering, exposure and protection of digital identity, personal and corporate	Attacks on the human factor and related risks	ADM	03/10	10.00-13.00	3
		OPS	07/10	10.30-13.30	3
		ENG	08/10	10.00-13.00	3

- b) UIC - In order to maximize the potential interest in the CYRUS learning pathways, while ensuring that – during the pilot delivery phase – valuable feedback is gathered from relevant stakeholders

within the Transport/Railway sector at EU level, UIC has adopted the multi-faceted approach hereby described:

- Organization of a national Info event. CYRUS Catalogue was illustrated to senior cybersecurity experts from major railway companies at EU level during the UIC CSSP (Cyber Security Solution Platform) Working Group meeting that took place on 6 June 2024 online.

- Direct contacts with European Members of the UIC Security Platform (including ad hoc, 1-to-1 meetings when requested).

- Dissemination within the UIC Special Group COLPOFER (Collaboration of railway police and security services) towards senior security management of major railway companies at EU level in three different occasions:

- 30 – 31 May 2024, 77th Colpofer General Assembly, Riga, Latvia.
- 18 March 2024, Colpofer Working Group on Cybercrime.
- August / September 2024 (date TBD), Colpofer Working Group on Cybercrime.

- Direct involvement. UIC will also directly take part in the CYRUS pilot phase, engaging internal personnel belonging to the Administrative and Engineering target groups;

- c) EITM - will implement a multi-level approach to advertise and disseminate the pilot training. As work package leader for communications (WP4), EITM will promote the pilots to their own community, and support all partners in their efforts by creating communication materials, such as a catalogue of all pilot training and social media content. The pan-European community of EITM has a focus on manufacturing and consists of approx. 130 industry partners, i.e. SMEs and large corporations, and around 50 network partners from industry associations via NGOs to accelerators and incubators. Furthermore, EITM nurtures a community of several hundred startups in Europe. In total, the EITM community spans more than 20 European countries. Six regional hubs in Athens, Milan, Vienna, Darmstadt, San Sebastian and Gothenburg as well as several hubs especially in Eastern Europe will support the dissemination. EITM will promote the pilot training via their corporate newsletter, website, corporate and individual social media channels and individual email invitations. Moreover, EITM will publish the pilot trainings on the project website and promote them on social media, the project newsletter as part of the communication activities carried out in WP4;
- d) LIC - will directly contact companies in transport and industry sectors that participated in the survey (WP1) to identify cyber security skills needs and competences and with other companies in transport and industry sectors as well as SMEs with which the Lithuanian Innovation Center has a strong and long-standing collaborative relationship;

- e) EPIHAL - with over 11,000 active members, including 6,000 from various manufacturing industries, EPIHAL's strategy includes direct member engagement, digital campaigns, and participation in major industry events to ensure broad reach and high participation. To inform members about the training opportunities, EPIHAL will leverage well-established communication channels. Weekly newsletters sent to all members will feature detailed information about the CYRUS training, ensuring consistent dissemination. Additionally, press releases will be issued to local media. Furthermore EPHIAL's active participation in the Thessaloniki International Trade Fair (TIF-HELEXPO) will be a significant event for promoting the CYRUS training. EPIHAL will be able to showcase the CYRUS project, distribute brochures, and provide detailed information about the upcoming training delivery. This engagement will enable them to reach a diverse audience, including potential participants from various sectors. Digital and social media campaigns will ensure that information about the CYRUS training is prominently featured on EPHIAL's website and shared across their corporate and individual social media channels. Lastly, personalized email invitations will also be sent to members who are most likely to benefit from the training, ensuring that the information reaches the right audience efficiently;
- f) ITKAM: To acquire participants for the pilot delivery, ITKAM's strategy will be based on the following pillars: a) Massive Direct Marketing Campaign: ITKAM possesses a substantial number of contacts in the transportation and manufacturing sectors, thanks to its numerous initiatives in these fields. ITKAM has been present for several years at important German events such as the Hannover Messe, Innotrans, Z/Intec fairs, and Grindtec, either as an event organizer, a collective exhibitor, or a fair representative. This presence has enabled ITKAM to build a significant database of companies in these sectors. b) Support from Multipliers: Industry associations (e.g., IMW e.V. Interessenvereinigung Mittelständische Wirtschaft) will be contacted to act as multipliers and disseminate the invitation within their communities. c) Dissemination Campaign through ITKAM's Social Media: This includes ITKAM's LinkedIn (5.851 followers), Facebook (3.844 followers), Instagram (880 followers), and ITKAM's newsletter (approximately 1.900 contacts).

Dissemination process will be supported by the dedicated event (webinar that is planned on the 23rd of July 2024 to present training courses available for pilot) and promotional materials prepared by EITM (C&D Leader), using a dedicated page on the CYRUS website: <https://cyrus-project.eu/pilot-trainings/> and all project's and partner's communication channels available. One of the channels used are social media (examples of posts planned are below).



CYRUS enhanced cybersecurity skills

Co-funded by the European Union

Join the cybersecurity training:
**Incident response –
Preparation phase**

Learn how to properly respond to a cybersecurity incident

Cybersecurity training helps!

Provided by

CYBER RANGES
with Silessec

Save your seat!



CYRUS enhanced cybersecurity skills

Co-funded by the European Union

REGISTRATION IS OPEN!

**SAFE YOUR SEAT AND JOIN OUR
CYBERSECURITY TRAININGS FOR FREE**

Figure 5 Example of social media posts for pilot trainings promotional activities

The other example of the promotional materials is roll-up designed to facilitate sectoral meetings where the plans for pilot sessions can be presented (shown in Figure 6).



Figure 6 Example of roll-up for pilot trainings promotional activities

One of the most important materials provided to facilitate the process of promoting pilot sessions is a pilot catalogue, created in a form of dedicated .ppt presentation. It presents the overall idea of the CYRUS training offer, describing target groups, proficiency levels, learning tracks proposed for pilot delivery etc. Each training course offered in a pilot delivery is described as a single slide. All partners will use the Catalogue of pilot training as a supporting material while recruiting participants.



Figure 7 CYRUS catalogue of pilot trainings

Training providers' partners will support the pilot delivery dissemination process as they have access to their external networks and experience in attracting prospective participants. In order to ensure adequate attendance of an average of 10-15 people (from at least 5 organizations) for each pilot training

course, each project partner is committed to recruit a total of at least 26 participants overall for all courses offered in the pilot phase.

Performing preliminary assessment

All project partners will contribute to preliminary assessment of the training courses. CYRUS business and professional associations partners will bring as participants – stakeholders, representatives of each sector, persons at various positions, ensuring the presence of all target groups to collect qualitative, direct, sectoral feedback, covering the interests of all potential beneficiaries of the training and national specificities of the sector.

Training providers' partners will incorporate the assessment tools presented in the portfolio (described in section 3.3.2) in order to collect feedback both in terms of participants' satisfaction and in terms of knowledge and skill improvement. They will start the training by introducing pre-test (excluding training offered by Cyber Ranges because of their specific nature) and complete the training activities by providing links to post-test and satisfaction survey. Training providers will make every effort to ensure that training participants complete the pre-, post-test and satisfaction survey as it determines whether trainees will receive certificates. SEARCH-LAB will be responsible for gathering all results of the preliminary assessment in one place using CRM Odoo Tool described in section 4.1.4.

Within WP3, task T3.6 has the specific purpose of dealing with assessment, with the leading role of PPHS – partner responsible for editing and submitting D3.6 (*Report on training assessment intermediate* due in M24). T3.6 will carry out a formal assessment after the completion of the cybersecurity pilot training courses in the different sectors to analyse the impact of the CYRUS training by promoting self-evaluation to assess personal and professional impact of training for each trainee using the assessment methodology developed in T3.1 in the last day of the training.

4.1.3 Pilot delivery schedule

Pilot delivery schedule is dictated by a realistic approach and takes into account available resources and the effective distribution of work in individual months of the project. The pilot delivery is scheduled to launch on July 1 2024 (M19) and end in mid October 2024 (M22), securing space in the second half of October for possible additional sessions if it is necessary to deepen the preliminary assessment.

The schedule presented below provides a general outline of the pilot training delivery, captured as a process. The specific times and dates in reference to a particular training course are presented in Table 5 - *List of the training modules available for Pilot Delivery*. The timetable given may change in the event of lack of interest in the particular course or insufficient number of participants (e.g. in case of the training offered by SLAB and DBL - minimum 5 participants are needed to launch the course).

Table 7 Pilot delivery schedule

Pilot delivery schedule								
	M17	M18	M19	M20	M21	M22	M23	M24
Recruitment of participants								
Running pilot training								
On site training slots available								
Feedback summary								
Submission of the D3.6								

4.1.4 Tool supporting Pilot delivery

The approach to make the CYRUS training offer available in one-stop shop, brought the consortium to the decision to use the CRM tool Odoo [6] hosted by SLAB. Using the tool will facilitate the registration process, coherent presentation of the catalog of available training, tracking the training participant's learning progress by viewing pre - and post-tests and moreover automating the process of summarizing the evaluation results as well as issuing of certificates. The pilot will also allow the consortium to check whether the use of CRM tool Odoo was effective and can be used to support final delivery.

4.1.5 Pilot delivery language constraints

Each training provider offering the course decides in which language the training course will be delivered. Based on the D2.1 findings and results of the additional survey conducted by SLAB among prospective participants in M17, the consortium has decided that all courses will be offered in English and additional language available will be Polish (PPHS' course) as a result of training providers capacity during the pilot delivery. At the same time, the recruitment process will determine whether there is a significant need for providing training courses in other languages. Training providers will take these findings into consideration during the optimisation process (M25-M27).

4.2 Final delivery plan

4.2.1 Scope and objectives

The Final Delivery of the short-term training courses (developed under WP2 and optimized under WP3) is the culmination of efforts to design and fine-tune CYRUS training with **the aim to provide cybersecurity customized training modules across the selected industrial sectors and the different roles within the organisations.**

At the stage of the project when D3.1 is going to be submitted (M18), the final catalog of available training cannot be presented, as it will be the result of feedback obtained at the pilot delivery. As of today, we know that the list of training courses (presented in Table 5 - *List of the training modules*

available for Pilot Delivery will be assessed in terms of usefulness for business representatives from the selected sectors and adapted to ensure a full training offer, consistent with the Competence Framework developed under WP1.

4.2.2 Roles and responsibilities

All project partners will be involved in final delivery, playing different roles. The overall coordinator of the final delivery will be SLAB as a WP3 leader with the significant support of the task leaders: T3.3: DBL (for Transport), T3.4: CEF (for Manufacturing) and T3.5: ITKAM (for SMEs).

Gathering participants for final delivery

Professional associations partners i.e.: EITM, ITKAM, UIC, EWF, LIC and EPHIAL will play a key role in reaching potential training participants. Each of the partners mentioned above has prepared a draft strategy in order to recruit participants for the final delivery:

- a) EWF will build on the success of the pilot phase with a more comprehensive and scalable approach. EWF will launch a broader marketing campaign, utilizing digital channels such as social media, the EWF website, and identify industry hubs to reach a wider audience, using plan implemented for pilot delivery but on a larger scale. Success stories and testimonials from the pilot phase will be collected to showcase the impact of the CYRUS training. With a great number of partners from industry with several meetings all over Europe for the 2025 EWF plans to add one to two days more to organise and deliver the final training courses. EWF will also increase its presence at major industry conferences and exhibitions, setting up dedicated booths and hosting workshops to promote the CYRUS training program to a diverse audience of professionals. EWF will partner with vocational training centers, technical schools, and universities to integrate CYRUS training into their curriculums or offer it as a supplementary program. This will help attract students and professionals looking to enhance their skills. The implementation of the strategy will start between October and December 2024 - understanding that this is the time in which organisations normally assess their training needs and develop their training plans for the following year;
- b) UIC will – in addition to its direct involvement – continue to exploit all the dissemination channels that have been set up to promote the pilot phase towards security and cybersecurity experts during the upcoming meetings. As an example: UIC CSSP Working Group: meetings to be held on 17 September 2024 / 29 October 2024; Colpofer Cybercrime Working Group meeting, to be held in early 2025. Additionally, CYRUS learning pathways will be promoted during the UIC World Security Congress 2024 that will take place in Paris on 2 - 4 December 2024. Lastly, UIC commits to further promote CYRUS Trainings within the context of any other relevant future event/occasion not listed above.

- c) EITM will implement a multi-level approach to advertise and disseminate the training. As work package leader for communications, EITM will promote the training to their own community, and support all partners in their efforts by creating communication materials, such as a catalogue of all pilot training and social media content. The pan-European community of EITM has a focus on manufacturing and consists of approx. 130 industry partners, i.e. SMEs and large corporations, and around 50 network partners from industry associations via NGOs to accelerators and incubators. Furthermore, EITM nurtures a community of several hundred startups in Europe. In total, the EITM community spans more than 20 European countries. Six regional hubs in Athens, Milan, Vienna, Darmstadt, San Sebastian and Gothenburg as well as several hubs especially in Eastern Europe will support the dissemination. Additionally, EITM will launch its Academy in September 2024 and will use this channel to advertise the training courses and grant easy access to a broad range of stakeholders. EITM will promote the training via their corporate newsletter, website, corporate and individual social media channels and individual email invitations. Moreover, EITM will publish the training on the project website and promote them on social media, the project newsletter as part of the communication activities carried out in WP4.
- d) LIC will outreach to transport and industry sector companies and SMEs through communication on portals and social networks managed by the Lithuanian Innovation Center. LIC will directly reach companies in the transport and industry sectors as well as SME with which the Lithuanian Innovation Center has a strong and long-lasting collaborative relationship. Additionally, it will contact transport and industry associations and clusters of sectoral enterprises with which the Lithuanian Innovation Center has also a long-lasting partnership. The Vilnius Chamber of Commerce and Crafts, Kaunas Chamber of Commerce and Crafts and Klaipėda Chamber of Commerce and Crafts will be engaged in dissemination activities. Participants will also be attracted through the European Enterprise Network. The Lithuanian Innovation Center is the coordinator of the European Enterprise Network in Lithuania.
- e) EPIHAL's strategy will follow the assumptions gathered at the stage of the pilot delivery with the relevant updates in terms of events etc.
- f) ITKAM: For the final delivery, ITKAM will follow a strategy similar to the one used for the pilot delivery, focusing on three main pillars: a) Direct mailing campaign: Utilizing a targeted direct mailing approach to reach potential participants. b) Engagement of multipliers: Collaborating with industry associations and other influential entities to act as multipliers and disseminate information within their networks. c) Social Media and Newsletter promotion: Leveraging ITKAM's social media channels and newsletter to promote the final delivery. For the pilot delivery, ITKAM plans to engage its already established contacts. For the final delivery, ITKAM will expand its efforts by reaching out to new multipliers and enlarging its existing databases to ensure a broader outreach.

In order to reach the stakeholders' groups representing Transport and Manufacturing sectors as well as SMEs representatives in general, each project partner will organise the national CYRUS Training Info Day event to promote training available in final delivery (ideally in parallel with the sectoral event taking place aside). The idea of the national event is to strengthen the dissemination activities of the available training sessions. The detailed schedule of the final delivery described in section 4.2.3 refers also to the national CYRUS Training Info Day schedule.

Dissemination process will be supported by the dedicated promotional materials prepared by EITM (C&D Leader), using a dedicated page on the CYRUS website: <https://cyrus-project.eu/pilot-trainings/> and all project's and partner's communication channels available.

Additionally, the Knowledge Center (described in details in Chapter 6), planned to be launched in M24, will be a dedicated part of the CYRUS website, that will help to present CYRUS training catalogue at the stage of the final delivery.

Providing final sessions

Task leaders: T3.3: DBL (for Transport), T3.4: CEF (for Manufacturing) and T3.5: ITKAM (for SMEs) will be responsible for the coordination of the final delivery in particular sectors and related optimization of courses, in according with the recommendations illustrated in the deliverables:

- D3.2 "Report on the pilot delivery of short-term training courses" (M24) that will summarise the results of the preliminary assessment and pilots providing recommendations for further optimization of the training modules per sector;
- D3.6 "Report on training assessment" (M24) that will include the results of the assessment of the pilot short-term training courses.

Apart from that Training providers' partners i.e.: PPHS, CyberRanges, Cefriel, Deep Blue and SEARCH-LAB are responsible for providing final session events. Flexible approach to the Final delivery Plan results in readiness to offer different formats and delivery methods according to the results of the feedback gathered during pilot sessions and summarized in D3.6 (M24). The overarching principle adopted in the Final training delivery Plan is that the partner, providing the training, is responsible for its overall organization (including all logistics, provision of trainers and training materials etc.) and carrying out assessment activities. SEARCH-LAB team as a WP3 Leader will be, similarly to the pilot phase, the main contact point, distributing among other relevant partners all prospective participants' queries, regarding final training courses.

Performing final assessment

All training providers will be responsible for ensuring the smooth evaluation process conducted during final delivery. Their active role will be important from the beginning of the course when they will have to inform participants about the mandatory completion of pre-tests, by actively encouraging trainees to complete the post-test and satisfaction survey at the end of the training, in order to receive a certificate. All data collected with the use of assessment tools will be stored in one place (presumably CRM Oodoo tool provided by SLAB). Within WP3, task T3.6 has the specific purpose of dealing with assessment, with the leading role of PPHS – partner responsible for editing and submitting D3.7 (*Report on training assessment final* due in M36). T3.6 will carry out a formal assessment after the completion of the cybersecurity short-term training courses in the different sectors to analyse the impact of the CYRUS training using as one of the elements self-evaluation to assess personal, technical and professional impact of training for each trainee based on the assessment methodology developed in T3.1 in the last day of the training and by leveraging qualitative research methods to determine the actual effectiveness of the training. Leaders of the T3.3, T3.4 and T3.5 will be actively engaged in the analysis of the results as they are responsible for the delivery of: D3.3 ‘Cybersecurity training activities with organisations of the Transport domain: results and recommendations’ DBL, (M36); D3.4 ‘Cybersecurity training activities with organisations of the Manufacturing domain: results and recommendations’, CEF, (M36); D3.5 ‘Cybersecurity training with Micro, Small, and Medium Enterprises: results and recommendations’, ITKAM, (M36). Additionally, all training providers will be engaged in the summary of the results of the training evaluation as the process will provide feedback not only on the trainee ‘performance but also on the technical aspects of the training sessions. Having in mind the responsibilities described above, the important role of professional associations partners i.e.: EITM, ITKAM, UIC, EWF, LIC and EPHIAL should also be noted. They remain main contact points to reach relevant stakeholders, taking part in CYRUS training experience, in order to implement post-hoc assessment, conducting structured interviews with trainees and if possible (relying on their availability) with sectoral employers. Depending relevant partners (particular training providers and industry partners) will be engaged in conducting post-hoc interviews.

4.2.3 Final delivery schedule

Final delivery will be preceded by a training optimization process, shaping the final CYRUS training offer. Once the final number of training courses on offer is established (M25) a detailed plan for their delivery, proposing specific dates will be developed (M26) including times and dates. The detailed timetable of the final delivery with times and dates will be available on CYRUS website during the registration process. D3.7 submitted to M36 will summarize the entire process and describe the detailed timeline in which the training was delivered.

Table 8 Final delivery schedule

Final delivery schedule												
	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36
Optimisation of the training modules for Transport, Manufacturing and SMEs	■	■	■									
Sectoral plans to reach the targeted audience												
Dissemination and recruitment for final delivery			■	■	■	■	■	■	■			
National Info Days			■	■	■	■	■	■	■			
Running final training for Transport, Manufacturing and SMEs				■	■	■	■	■	■	■		
Evaluation/assessment process				■	■	■	■	■	■	■	■	
Feedback summary											■	■
Submission of the D3.7 (Report on training assessment Final)												■

4.2.4 Participants

The CYRUS project has ambitious plans to train a total of 5,000 professionals (1000 in Transport sector - T3.3; 1500 in Manufacturing sector - T3.4 and 2500 in SMEs – T3.5). The pilot delivery will demonstrate what challenges are generated by recruitment for training, designed and offered within CYRUS and will give an idea of possible existing limitations. Therefore, appropriate actions will be implemented to support the achievement of the target number of professionals trained. In accordance with the assumptions of T3.3 Optimisation and delivery of the training modules in the Transport sector, T3.4 Optimisation and delivery of the training modules in the Manufacturing sector, T3.5 Optimisation and delivery of the training modules, special module for SME, the average number of participants foreseen for each course is 10-15 people.

4.2.5 Formats and use of Cyber range platform

Formats of the courses offered within the final delivery will result from the feedback gathered during the recruitment process for pilot sessions as well as summary of the pilot training evaluation conducted. The relevant formats will be elaborated during the optimisation process. The final delivery formats will vary, depending on the course offered and the target audience (taking into account learning objectives defined in D2.1).

To ensure efficient course delivery dedicated cyber-range simulations in operational settings will be offered in final delivery. According to the objective of WP2, main training modules will be implemented in a cyber-range environment ensuring practical exercises, and on-the-job simulations for the different industrial sectors, based on relevant scenarios in the TM sectors and taking into account also the needs of SMEs.

Practical exercises in the meaning of the simulation-based training in the CYBER RANGES platform offers several key benefits for organizations looking to enhance their defensive capabilities. These benefits include:

1. **Realistic Environment:** CYBER RANGES provides a highly realistic and dynamic virtual environment that mimics real-world networks, systems, and cyber threats. This allows trainees to experience and respond to actual scenarios they might encounter in their professional roles.
2. **Hands-On Experience:** Through practical exercises and simulations, users can develop and refine their skills by directly interacting with the systems and responding to incidents. This hands-on approach is more effective for learning compared to traditional theoretical methods.
3. **Safe Learning Space:** The platform offers a secure environment where trainees can practice and make mistakes without the risk of causing real-world damage. This encourages experimentation and learning from errors.
4. **Scalable and Flexible:** CYBER RANGES can be tailored to the needs of different users, (whether individuals, teams, or organizations) or different market sectors (such as transport and manufacturing). It supports a wide range of scenarios, from basic training for beginners to complex exercises for advanced professionals.
5. **Immediate Feedback:** Participants receive instant feedback on their performance, which helps them understand their strengths and areas for improvement. This continuous assessment aids in faster skill improvement.
6. **Performance Metrics and Reporting:** The platform provides detailed metrics and reports on user performance, which can be used to track progress, identify gaps, and plan further training.

4.2.6 Language

All courses developed under CYRUS will be available in English. Additionally, each training provider will decide during the optimisation process (M25-M27) and based on the feedback from pilot sessions if there is a need and capacity to offer a particular training course in another EU language.

4.2.7 Post activities

Post-training activities will cover several important actions.

a) Training evaluation

During the last day of the training participants will be asked by training providers to fill in the post-test to assess the knowledge and skills improvement as well as a satisfaction survey to learn more about areas of the training that need some refinement (if applicable).

b) Issuing of Certificates

Participants will be rewarded by certificates. The Detailed rules of issuing certificates are described below in section 4.3.

c) Assessment of the Knowledge and Skills Retention

Training providers will come back to the participants that accomplished the course - two months after completing the training (applicable for the participants that will accomplish the course before September 2025 – as the summary of the results need to fit into the final date for closing the project: 31.12.2025) with a follow-up test assessing the knowledge and skill retention.

d) Evaluation of the Impact

The selected representatives of the Transport and Manufacturing as well as SME sectors (participants of the CYRUS training courses and separately - if available - their supervisors/employers) will be asked to take part in the structured interview (2 months after completing the course) to learn if employment situation of the trainees improved after the end of the training and understand if SMEs benefited from the courses provided under CYRUS (applicable to the participants that will accomplish the course before September 2025 – as the summary of the results need to fit into the final date for closing the project: 31.12.2025).

e) Further learning options

Participants will be encouraged to use the CYRUS Knowledge Centre (described in Chapter 6) to understand learning opportunities, emerging jobs and trends in the cybersecurity sector within the TM domains; explore study pathways for the industrial sectors etc. This approach will allow participants to accomplish the training with confidence that their professional development path is open and that selected CYRUS training courses can be the next steps on their educational route.

4.3 Certification

Implementing certification is important as it can help to authenticate the course, increase trainee's motivation and be an incentive to make an effort and complete the course successfully. The consortium investigated already available certification solutions, in particular OpenBadges [7], and found that OpenBadges is operated outside of the European Union, therefore sending the data of the participants could be prohibited by participating organizations. The partners decided to use SEARCH-LAB's well-established e-certificate solution as certificate generation and sending can be automated from the Odoo CRM. The certificates will also be available online (for validation on SEARCH-LAB's Odoo-connected e-certificate portal [8]) which can be shareable on social media platforms as well promoting the project and the courses. The portal also lists the table of contents for the certified courses adding more information and value to the certification. The condition for issuing the certificate will be that the participant completes the pre- and post-test as well as the satisfaction survey (excluding Cyber Range courses where only post-test and satisfaction survey will be obligatory to fill in as it is assumed that Cyber Range simulation's participants start from level 0).

In terms of CYRUS training the project consortium have foreseen to reward participants with two types of diplomas:

- a) **Certificate of attendance (Silver certificate)** – this document will confirm the participation in the CYRUS training course (applicable for both pilot and final delivery). The Certificate will be issued automatically based on attendance reported to SEARCH-LAB by the training provider partner after the completion of the course. The certificate in a PDF format will be sent directly to the participant's email provided during registration (and printed – in case of onsite format of the training). The certificates of attendance will count for the following KPI: - number of certifications/diplomas issued mentioned in section 2.3 of this deliverable.
- b) **Certificate of excellence (Gold certificate)** – this diploma will be the culmination of the entire training process carried out within one of the learning tracks (to be elaborated within the optimization process) and will confirm the effort made by the participant to acquire subsequent levels of knowledge and skills within the selected learning pathway (applicable only for final delivery). The assessment of gained knowledge will be measured by the post-assessment survey for each course regardless of the used platform. The consortium proposed to issue certificates for the participants reaching at least 75% score on the post-assessment test. SLAB as a WP3 coordinator and owner of Odoo CRM will be responsible for determining who is eventually entitled to receive Certificate of Excellence.

The Project Consortium will develop the final versions of the Silver and Gold Certificates using the Certificate Template available so far for the purpose of pilot delivery (shown in Figure 8).



Figure 8 Certificate Template for the Pilot Delivery

5 Enrollment procedure

This procedure provides a formal framework for the CYRUS training course enrolment procedures to ensure a consistent approach to the management of enrolment in accordance with the CYRUS Privacy Policy [9]. The CYRUS project ensures its compliance with General Data Protection Regulation (Regulation (EU) and is committed to protect personal data with respect to privacy.

The CYRUS enrollment procedure applies to applicants and target users from transport and manufacturing sectors and for companies of all sizes, from SMEs to large enterprises, which enrolled in any training activities' delivered during the course of the project (both during the pilot as well as final delivery).

The CYRUS project ensures that its enrolment processes are accessible and responsive. This is achieved through:

- a. the provision of clear, comprehensive and accurate information to both prospective and current applicants regarding all enrolment-related processes, support services and policies. This includes information about critical enrolment dates and requirements; procedures for withdrawal; and relevant project policies. Information is provided in plain English and is designed to accommodate participants from diverse backgrounds,
- b. the design and implementation of enrolment processes that are as streamlined as possible with a commitment to continuous improvement of processes,
- c. the provision of a range of applicants support services, accessible avenues for feedback and complaints, and a commitment to respond to issues as expeditiously as possible.

Overall, the CYRUS project will provide a transparent, informative enrolment process in order to gather required enrolment data and to ensure that its courses are customised and appropriate for enrolling applicants.

5.1 Admissibility rules

Admissibility procedures are conducted when the project does not have to examine whether an applicant qualifies for a training course because of specific circumstances. A person is eligible to enroll as a participant of CYRUS training course if he or she belongs to the project's target group, already identified at the proposal level:

- a. professionals and practitioners in the cybersecurity sectors,
- b. workers at all levels in the TM sectors,
- c. cybersecurity training providers,
- d. transport and manufacturing industries and their supply-chain (including SMEs),
- e. transport service providers,
- f. EU institutions.

The target audience for the projects courses is extensive, however, there is a special condition for participation in the CYRUS training - **the project cannot deliver courses for organisations outside the EU because of receiving fundings from the EC to train organisations in the EU countries**. In addition, some background knowledge and/or skills are required to complete the course successfully. The target group of the proposed training sessions are workers at all levels: new entrants building the required competences (skilling), professionals and managers improving and upgrading their expertise (upskilling and reskilling) updating on existing and emerging sector skills. Cybersecurity training paths are customised for different roles in organization.

5.2 Enrolment process

Enrolment into the CYRUS course is through a dedicated registration form available on the project website: <https://cyrus-project.eu/pilot-trainings/>. Instructions on the website encourage potential

participants to join the course, however, before submitting an electronic expression of interest, they must familiarize themselves with the enrolment procedures and admissibility rules. The registration form includes the mandated privacy statement regarding authorised use of personal information and feedback provided by participants. A prerequisite for participation in the training is confirmation of reading enrollment procedures and consent to the processing of personal data. In case of any problems with registration, the participant will be able to contact a dedicated help desk, whose contact details will be provided on the CYRUS website.

After completing the registration form, the participant receives information about the validation process. Enrolment into a training course is on a first in first serve basis and is confirmed on receipt of a completed registration form. If there are no places available on the course, then the participant will be contacted and placed on a waitlist or enrolled in another course as agreed by the participant.

After a successful review of registration, participants receive a confirmation email with more information and next steps.

Participants may withdraw from a course at any time, however, they shall contact the Organiser via email as soon as possible that they are unable to attend, so that other participants on a waitlist can be given the opportunity to attend.

CYRUS project makes every effort to deliver courses on scheduled days. However, there may be extenuating circumstances that may lead to workshop cancellations. For example, inclement weather and other natural disasters leading to disruptions to travel arrangements. CYRUS reserves the right to cancel a scheduled course without incurring any costs or liabilities, for example costs that participants have outlaid in advance of attending the workshop.

Information on how to join the CYRUS training courses in five steps is shown in Figure 9.

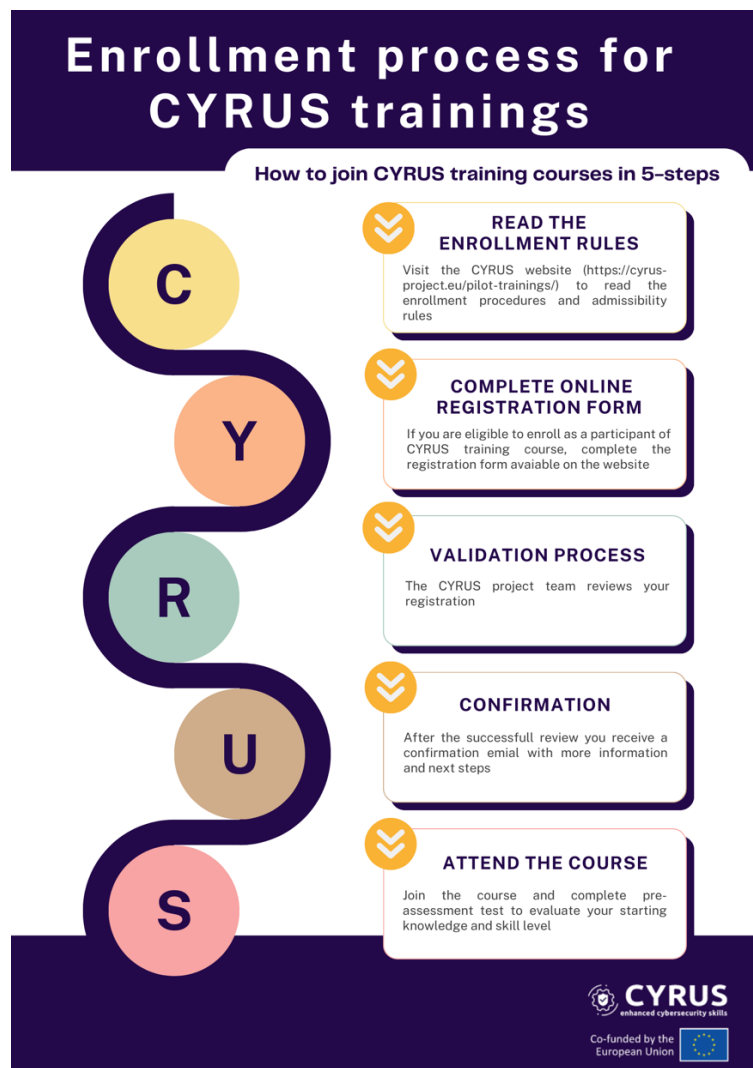


Figure 9 Enrollment process for CYRUS trainings

6 Conclusions and next steps

This document has presented the consortium' approach in terms of training assessment methodology and the related tools, as well as the training delivery plans. The New World Kirkpatrick's model has been adopted as the starting point for the training evaluation methodology. The portfolio of the assessment tools has been presented (including pre-, post-, follow up- tests, satisfaction survey, practical exercises on Cyber Range platform, as well as structured interviews) in order to gain qualitative and quantitative feedback and eventually provide the customized training offer. The results of the preliminary assessment of the pilot short-term training courses will be presented in D3.6 "Report on training assessment intermediate" (M24) and will support the optimisation process planned for M25-M27. The results of the final assessment will be presented in D3.7 'Report on training assessment Final' (M36) where the overall

effort made by Consortium in fine-tuning training modules will be summarized and recommendations for future cybersecurity training design and delivery for Transport and Manufacturing sector will be formulated. The pilot delivery will be summarized in D3.2 “Report on the pilot delivery of short-term training courses” (M24). An in-depth summary of the performance of the training sessions conducted as part of the final delivery will be available by sector accordingly in D3.3 ‘Cybersecurity training activities with organisations of the Transport domain: results and recommendations’ (M36), D3.4 ‘Cybersecurity training activities with organisations of the Manufacturing domain: results and recommendations’ (M36); D3.5 ‘Cybersecurity training with Micro, Small, and Medium Enterprises: results and recommendations’ (M36).

The CYRUS consortium will make an extra effort to ensure that the project's achievements are available even after its completion, contributing to strengthening EU enterprises in the fight against cyberattacks. The Knowledge Center planned to be launched in M24 will be a dedicated part of the CYRUS website that will help to sustain the availability of CYRUS training courses after the completion of the final delivery. It will store the competence framework and cybersecurity curricula for different profiles in the TM sector, training modules and activities and guidelines developed during the CYRUS project. The center itself will be designed according to Cybersecurity, Privacy and Data Protection best practices to ensure compliance with National and EU regulations (GDPR). Users accessing the center will be able to: a) understand learning opportunities, emerging jobs and trends in the cybersecurity sector within the TM domains; b) understand future skills demand in the cybersecurity domain across the two industrial sectors; c) explore and build study pathways for the industrial sectors under analysis; d) identify the skills needed and invest in staff training for career development and skills upgrading. Furthermore, the center will include short videos, training pills and interactive games enhancing the development of the cybersecurity culture in the domains. The activity of the center will continue beyond the project duration.

References

- [1] CYRUS project. D1.2 "Cybersecurity competence framework", 2024
- [2] Badriya Ambu-Saidi, Fung, C.Y., Turner, K., & Lim, A.S.S. "A Critical Review on Training Evaluation Models: A Search for Future Agenda", 2024
- [3] Dr. Jim Kirkpatrick, Wendy Kayser Kirkpatrick. "An Introduction to The New World Kirkpatrick® Model", 2022
- [4] Noe and Schmitt. "Motivation for Training Scale", 1986
- [5] Brief no 17: Data Collection Methods for Program Evaluation: Interviews; available at <https://www.cdc.gov/healthyyouth/evaluation/pdf/brief17.pdf>
- [6] <https://www.odoo.com/app/crm>
- [7] <https://openbadges.org/>
- [8] <https://cert.scademy.com/certificate>
- [9] <https://www.iubenda.com/privacy-policy/14000817>

Annex 1 CYRUS Satisfaction Survey

CYRUS Satisfaction Survey

This is the first step of the CYRUS evaluation process, based on the Kirkpatrick's model, where participants' are asked to evaluate their satisfaction after completing the course. This process measures:

- The relevance of the learning objectives.
- The ability of the course to maintain interest.
- The amount and appropriateness of interactive exercises.
- The perceived value and transferability to the workplace.

This test incorporates different types of questions to gather a comprehensive range of feedback.

General information

Part A. ABOUT YOU	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. ABOUT YOUR ORGANISATION	
Name	
Sector	
Website	

Information about the training course

Part A. ABOUT THE TRAINING COURSE	
Title of training course	<i>Expandable list with all trainings from the mini catalogue.</i>
Form of training course	<i>Expandable list with the following (3) options: online, e-learning, in-person.</i>
Date of training course (does not apply to the e-learning training).	

Part B. EVALUATION OF THE TRAINING COURSE						
Grading scale from 1 to 5						
1. definitely not	2. rather not	3. difficult to say	4. rather yes	5. definitely yes		
		1	2	3	4	5

The training was useful in the context of my daily duties at work.					
Training materials were adequate (does not apply if materials were not provided) to the topic and description of the course.	1	2	3	4	5
The training was sufficiently personalised and tailored to my personal and professional needs.	1	2	3	4	5
The course's title and description were easy to comprehend?	1	2	3	4	5
The training methods (e.g. eLearning, practical exercises, case studies) used during the course were appropriate for me.	1	2	3	4	5
If not, why? Please explain.					

Part C. EVALUATION OF THE TRAINER (does not apply to the e-learning training).

Grading scale from 1 to 5

1. definitely not 2. rather not 3. difficult to say 4. rather yes 5. definitely yes

The knowledge and experience of the trainer was relevant to the topic of the training.	1	2	3	4	5
Knowledge was provided in an accessible and comprehensible manner.	1	2	3	4	5

Part D. ADDITIONAL INFORMATION AND FINAL EVALUATION OF THE TRAINING COURSE

Grading scale from 1 to 5

1. definitely not 2. rather not 3. difficult to say 4. rather yes 5. definitely yes

Participation in the training allowed me to gain additional knowledge in the area covered.	1	2	3	4	5
	1	2	3	4	5

Participation in the training allowed me to gain additional skills in the area covered.					
Did you feel that the training was worth your time?	1	2	3	4	5
If not, why? Please explain.					
What would you suggest to improve in the future edition of this training?					
Are there any other cybersecurity training topics that you would be particularly interested in?					

Additional comment to the training course (not obligatory).

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Annex 2 CYRUS Pre- Training Assessment Test

CYRUS Pre- Training Assessment Test

In order to effectively prepare the CYRUS training course, it is important to gather participants' baseline knowledge and skills for entry level.

General information

Part A. ABOUT YOU	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. ABOUT YOUR ORGANISATION	
Name	
Sector	
Website	

Information about the training course

Part A. ABOUT THE TRAINING COURSE	
Title of training course	<i>Expandable list with all trainings from the mini catalogue.</i>
Form of training course	<i>Expandable list with the following (3) options: online, e-learning, in-person.</i>
Date of training course (does not apply to the e-learning training).	

Part B. SELF-ASSESSMENT					
<i>Grading scale from 1 to 5 (5 being very good).</i>					
How would you rate your level of knowledge in the subject matter of this training before you attend this course?	1	2	3	4	5
How would you rate your level of skills in the subject matter of this	1	2	3	4	5

training before you attend this course?					
Grading scale from 1 to 5					
1. definitely not		2. rather not		3. difficult to say	
		4. rather yes		5. definitely yes	
I believe it will be worthwhile to put the knowledge gained from the training into practice.	1	2	3	4	5
I believe it will be worthwhile to put the skills gained from the training into practice.	1	2	3	4	5

Example of pre-training assessment questions

This part must be completed by each training provider depending on the training content at the level of each track described in the Pilot delivery plan section.

Part C. KNOWLEDGE AND SKILLS ASSESSMENT			
What is a malware?	A	B	C
	A software that can protect us from computer viruses.	Malicious software or code that can cause damage to a system and put it at risk.	A video game available on Play Store and iOS.
Do cyberattacks rely exclusively on technological attack vectors?	A	B	C
	Yes, technology is the dominant component in cybersecurity.	No, attack vectors can be physical or intangible.	Attack vectors can be both technological and human.
When you receive an email with an attachment from a sender you don't know, what do you do?	A	B	C
	I don't get many emails that include an attachment. I usually open them without any problems when I'm sure I know the identity of the sender by carefully checking the source email. When I don't know the sender, I avoid opening the attachment	I always scan attachments with Anti-Virus: if the file is clean, it means that I can open it without any problem.	I'm obsessed with security: I never open attachments because they could be trojans.

	especially if it is not deemed necessary based on the situational context of the email.		
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Annex 3 CYRUS Post- Training Assessment Test

CYRUS Post- Training Assessment Test

In order to effectively evaluate the success of the CYRUS training program, it is important to gather participants' feedback on the training effectiveness. This test aims to assess the knowledge and skill improvement and gain valuable insights into the strengths and weaknesses of the course to make informed decisions about necessary improvements.

General information

Part A. <u>ABOUT YOU</u>	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. <u>ABOUT YOUR ORGANISATION</u>	
Name	
Sector	
Website	

Information about the training course

Part A. <u>ABOUT THE TRAINING COURSE</u>	
Title of training course	<i>Expandable list with all trainings from the mini catalogue.</i>
Form of training course	<i>Expandable list with the following (3) options: online, e-learning, in-person.</i>
Date of training course (does not apply to the e-learning training).	

Part B. <u>SELF-ASSESSMENT</u>					
<i>Grading scale from 1 to 5 (5 being very good).</i>					
How would you rate your level of knowledge in the subject matter of this training after you attend this course?	1	2	3	4	5
	1	2	3	4	5

How would you rate your level of skills in the subject matter of this training after you attend this course?					
Grading scale from 1 to 5					
1. definitely not		2. rather not		3. difficult to say	
4. rather yes		5. definitely yes			
Participation in the training will allow me to put the knowledge gained into practice.	1	2	3	4	5
Participation in the training will allow me to put the skills gained into practice.	1	2	3	4	5

Example of post-training assessment questions

This part must be completed by each training provider depending on the training content at the level of each track described in the Pilot delivery plan section.

Part B. KNOWLEDGE AND SKILL ASSESSMENT			
What is a malware?	A	B	C
	A software that can protect us from computer viruses.	Malicious software or code that can cause damage to a system and put it at risk.	A video game available on Play Store and iOS.
Do cyberattacks rely exclusively on technological attack vectors?	A	B	C
	Yes, technology is the dominant component in cybersecurity.	No, attack vectors can be physical or intangible.	Attack vectors can be both technological and human.
When you receive an email with an attachment from a sender you don't know, what do you do?	A	B	C
	I don't get many emails that include an attachment. I usually open them without any problems when I'm sure I know the identity of the sender by carefully checking the source email. When I don't know the sender, I	I always scan attachments with Anti-Virus: if the file is clean, it means that I can open it without any problem.	I'm obsessed with security: I never open attachments because they could be trojans.

	avoid opening the attachment especially if it is not deemed necessary based on the situational context of the email.		
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Annex 4 CYRUS Follow-up Training Assessment Test

CYRUS Follow-up Training Assessment Test

In order to effectively evaluate the success of the CYRUS training program, it is important to gather participants' feedback on the training effectiveness. This test aims to assess the knowledge and skill retention after 2 months of attending the course.

General information

Part A. ABOUT YOU	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. ABOUT YOUR ORGANISATION	
Name	
Sector	
Website	

Information about the training course

Part A. ABOUT THE TRAINING COURSE	
Title of training course	<i>Expandable list with all trainings from the mini catalogue.</i>
Form of training course	<i>Expandable list with the following (3) options: online, e-learning, in-person.</i>

Part B. SELF-ASSESSMENT					
<i>Grading scale from 1 to 5 (5 being very good).</i>					
How would you rate your level of knowledge in the subject matter of this training after 2 months of attending this course?	1	2	3	4	5
How would you rate your level of skills in the subject matter of this	1	2	3	4	5

training after 2 months of attending this course?					
Grading scale from 1 to 5					
1. definitely not	2. rather not	3. difficult to say	4. rather yes	5. definitely yes	
Participation in the training allows me to frequently put the knowledge gained into practice.	1	2	3	4	5
Participation in the training allows me to frequently put the skills gained into practice.	1	2	3	4	5

Example of follow-up training assessment questions

This part must be completed by each training provider depending on the training content at the level of each track described in the Pilot delivery plan section.

Part B. KNOWLEDGE AND SKILL RETENTION			
What is a malware?	A	B	C
	A software that can protect us from computer viruses.	Malicious software or code that can cause damage to a system and put it at risk.	A video game available on Play Store and iOS.
Do cyberattacks rely exclusively on technological attack vectors?	A	B	C
	Yes, technology is the dominant component in cybersecurity.	No, attack vectors can be physical or intangible.	Attack vectors can be both technological and human.
When you receive an email with an attachment from a sender you don't know, what do you do?	A	B	C
	I don't get many emails that include an attachment. I usually open them without any problems when I'm sure I know the identity of the sender by carefully checking the source email. When I don't know the sender, I avoid opening the attachment	I always scan attachments with Anti-Virus: if the file is clean, it means that I can open it without any problem.	I'm obsessed with security: I never open attachments because they could be trojans.

	especially if it is not deemed necessary based on the situational context of the email.		
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Annex 5 CYRUS Interviews Questionnaire for participants

CYRUS Interviews Questionnaire for participants

In order to effectively evaluate the success of the CYRUS training program, it is important to gather participants' feedback on the training effectiveness. This questionnaire aims to gather information on whether the employment situation of participants has improved and whether they apply what they learned during training into practice.

This questionnaire incorporates open-ended questions to gather an in-depth range of feedback.

General information

Part A. ABOUT YOU	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. ABOUT YOUR ORGANISATION	
Name	
Sector	
Website	

Information about the training course

Part A. ABOUT THE TRAINING COURSE	
Title of training course	<i>Expandable list with all trainings from the mini catalogue.</i>
Form of training course	<i>Expandable list with the following (3) options: online, e-learning, in-person.</i>

Part B. ADDITIONAL INFORMATION AND FINAL EVALUATION OF THE TRAINING COURSE	
Did you find the knowledge gained through the CYRUS training course useful? Can you implement this knowledge into practice?	

<p>Did you find the skills gained through the CYRUS training course useful? Can you implement these skills into practice?</p>	
<p>What aspects of the CYRUS training course do you use into practice?</p>	
<p>Do you feel that your employment situation has been improved after the end of the training e.g. accomplishing the training contributed to your professional development? Why? Why not?</p>	
<p>Overall, did the CYRUS training course meet your expectations? Why? Why not?</p>	
<p>What additional learning modules would you like to see included in the course?</p>	
<p>Do you plan to engage in further training in this area? Why? Why not?</p>	

Annex 6 CYRUS Interviews Questionnaire for employers

CYRUS Interviews Questionnaire for employers

In order to effectively evaluate the success of the CYRUS training program, it is important to gather employers' feedback on the training effectiveness. This questionnaire aims to gather information on changes in participants' behavior and how SMEs can benefit by enrolling their employees to the CYRUS training courses.

This questionnaire incorporates open-ended questions to gather an in-depth range of feedback.

General information

Part A. ABOUT YOU	
First name	
Last name	
Job title	
Email address	<i>Please use your business email address that you used during the registration.</i>

Part B. ABOUT YOUR ORGANISATION	
Name	
Sector	
Website	

Part C. ADDITIONAL INFORMATION AND FINAL EVALUATION OF THE TRAINING COURSE	
Do you think the knowledge of your employees' gained through the CYRUS training course is applicable in practice?	
Do you think the skills of your employees' gained through the CYRUS training course is applicable in practice?	

<p>Do you think that your employee/employees have benefited from the CYRUS training course? What benefits do you see?</p>	
<p>Do you see any changes in your employees' behavior after the CYRUS training course?</p>	
<p>Do you plan to engage your employees' in further training in this area? Why? Why not?</p>	
<p>Would you have any suggestions for the further tuning of the training modules or training delivery?</p>	