

PATHWAYS TO MARKET REPORT 03

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About ENACT

ENACT is a knowledge network focused on the fight against crime and terrorism (FCT). The network is funded under the Horizon Europe Framework Programme in Cluster 3 – Civil Security for Society. The project addresses the call topic HORIZON-CL3-2022-SSRI-01-02 ‘Knowledge Networks for Security Research & Innovation’, aiming to collect, aggregate, process, disseminate and make the most of the existing knowledge in the FCT area.

The project aims to satisfy two major ambitions,

- Provide evidence-based support to the decision-makers in the EU research and innovation (R&I) ecosystem in the FCT domain, targeted explicitly at enabling more effective and efficient programming of EU-funded R&I for the fight against crime and terrorism.
- Act as a catalyst for the uptake of innovation by enhancing the visibility and reliability of innovative FCT security solutions.



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Acronyms

BAS	Business Acceleration Services
BRL	Business Readiness Level
CC	Clarity Checker
CERIS	Community of European Research and Innovation for Security
CRL	Commerical Readiness Level
CSE	Child Sexual Exploitation
EACTDA	European Anti-Cybercrime Technology Development Association
EIC	European Innovation Council
ETR	Europol Tool Repository
EU	European Union
EUCS	European Union Civil Security [taxonomy]
FCT	Fight against Crime and Terrorism
IRL	Integration Readiness Level
ISF	Internal Security Fund
KER	Key Exploitable Result
LEA	Law Enforcement Agency
LPERL	Legal, Privacy and Ethics Readiness Level
MFL	Multilingual Forensics Lexicon
PtM	Pathways to Market
R&D	Research and Development
REA	Research Executive Agency
R&I	Research and Innovation
SecRL	Security Readiness Level
SIA	Security Innovation Award
SME	Small and Medium Sized Enterprise
SocRL	Societal Readiness Level
TRL	Technology Readiness Level

EXECUTIVE SUMMARY

The ENACT Pathways to Market (PtM) report serves as a comprehensive framework designed to support FCT R&I projects in their journey from validation to market implementation. This report outlines the results from the second validation services performed by the ENACT project and the pathways to market report for the individually validated project solutions. These Pathways to Markets reports assist projects in identifying viable commercialisation routes and enhance their market potential. The PtM reports represent a crucial component of ENACT's validation facility, working in conjunction with ENACT External Cooperation activities to provide actionable recommendations for market uptake and exploitation.

The methodology combines expert validation through structured surveys with project self-assessment tools, creating a dual perspective on market opportunities and challenges. By leveraging the EU Civil Security (EUCS) taxonomy and operational validity assessments, the process ensures a comprehensive evaluation of each solution's market readiness and potential. This systematic approach enables the identification of both barriers and accelerators to market entry, while also highlighting standardisation and certification opportunities.

The report establishes a standardised framework for future PtM analyses, ensuring consistency and measurable value across all validated projects. This methodology will continue to evolve based on practical implementation experiences, maintaining its relevance and effectiveness in supporting the successful commercialisation of civil security innovations.

This final report gives the results of the ENACT validation facility services performed on 3 FCT R&I projects during the final ENACT annual event in Brussels on 23rd July 2026 (chapter 3). Furthermore in chapter 4, this study report elaborates on the so-called innovation valley of death and guidelines and approaches to overcome the barriers for market innovation uptake to higher TRL levels and beyond.

INTRODUCTION

The Pathways to market reports and studies are ENACT products that the project will offer to other FCT R&I projects that enter the validation facility as a part of the task on External Cooperation Activities. The reports will support these projects by providing recommendations for further marketability, identifying (innovative) pathways to uptake, and even providing recommendations based on the validation results of the solutions conducted by the ENACT pool of experts. These reports will be delivered to the projects before the end of their project in order to allow them to implement the recommendations made into their exploitation plans and actions.

In addition to the ENACT Validation Facility, the pathways to market reports (PtM) make up part of the task on Innovation Uptake and Exploitation Pathways. These project-specific pathways to marketability and innovation uptake will help to feed into the Impact Reports' section on exploitation, which will extrapolate the trends and insights from these PtMs.

Finally, this document will report on the performed ENACT Validation Facility service for the three FCT R&I projects (CLARUS, VANGUARD and MARIT-D) that were validated during the final Annual ENACT event on 23rd July 2026 in Brussels.

PATHWAYS TO MARKET - METHODOLOGY

The PtM reports follow a simple but effective methodology, using various information sources to explore potential ways to bring a validated technology to market. It then analyses the best routes and actions for successful adoption. In short, the goal is to find the most practical and effective path to commercialisation.

Validation Guidelines Survey to the Validators

The validators that are drawn from the pool of experts will act as the primary source of information for defining potential exploitation routes. To collect the necessary information to approve the technology, these experts are given validation guidelines which will include questions to assess the barriers and accelerators of the given technology/solution. For each project that goes through the validation facility, the validators will all be given the same guidelines in order to ensure uniform evaluation across the facility throughout the project lifetime. Mapping the solution/technology via the EUCS taxonomy will allow for ENACT to understand where it fits within the civil security market and better provide tailored recommendations for potential paths and actors to focus on when it comes to exploitation.

Following this mapping the operational validity of the technology/solution is analysed by the validator on behalf of ENACT. This will allow for ENACT partners and the validator to assess whether or not the technology/solution is able to perform in an operational setting, how easy the technology/solution is to use for the end-user, and potential areas for further development. These insights will play a crucial role in the final analysis.

Pathways to Market Survey to the Projects

Similar to the Validation Guidelines, a survey will be shared with the projects that are participating in the validation facility to understand what barriers and accelerators have already been identified by the project. The questions will be the same asked as those in the validation guidelines, and will measure how the project views what needs to be done in order to reach successful exploitation.

Additionally, the preliminary exploitation plan can be uploaded by the projects for ENACT to review, in order to better understand the Key Exploitable Results (KERs), their owners, and any potential standardisation/certification opportunities already underway.

In addition to the above survey, structured interviews with the project may be undertaken to better understand the project's existing exploitation plans.

Analysis & Production of Pathways to Market Report

Once the technology/solution has gone through the validation facility, the ENACT partners in charge of tasks on namely the Netherlands Police and European Organisation for Security (EOS), can begin analysing the outcomes. The first step in analysing the results of both surveys will be to compare the answers regarding the pathways to market and measuring the levels of congruence. In the case that the answers align, then the Netherlands Police and EOS will be able to define accurately the focus areas for the projects to successfully exploit their technology/solution based on Innovation Uptake and Exploitation Pathways and External Cooperation Activities the common results. Additionally, the Netherlands Police and EOS will be able to use the answers to the technologies and functions areas validators questionnaires to identify any trend suggesting one or more specific areas (Functions areas level 2) or technologies facing development and deployment issues.

In the case that the answers are not congruent, then the ENACT partners will prioritise the answers from the validators, ensuring that the end-user feedback lays the groundwork for the pathways to market. For example, they would need to isolate the new needs from the results, potentially find out more details to have a clear vision. This could be done through interviews with the experts. With the new information, adjustments would take place to better suit the technology to the needs of the end users. It would be important to ensure changes are documented. A shift in direction will lead to a more successful and useful final product.

These conclusions could enable the identification of the key areas for increased support and the definition of the most suitable supporting scheme.

PATHWAYS TO MARKET FOR VALIDATED FCT PROJECTS

During the 3rd Annual ENACT event on 16 and 17 December 2025 in Lisbon, the ENACT Validation Facility was performed on nine FCT-funded project solutions. The Validation Facility uses the MultiRATE assessment and comprises validation by external experts and a self-assessment by the project team of the validated solution.

MultiRATE (Holistic framework for the MatUritY evaLuation of ReAdiness level for security Technologies), funded by Horizon Europe under Grant Agreement #101073929, aimed to support the European research and development (R&D) community, European Commission (EC)-Chaired initiatives, Community for European Research and Innovation for Security (CERIS), and European Commission Agencies with a multi-disciplinary and holistic evaluation methodology and calculation to measure the Readiness Level (RL) of the outputs of EU R&D projects. It was built upon seven main RL domains: Technology RL (TRL), Societal RL (SocRL), Security RL (SecRL), Legal, Privacy and Ethics RL (LPERL), Integration RL (IRL), Commercialisation RL (CRL) and Manufacturing RL (MRL). Therefore, MultiRATE provides an advanced cross-disciplinary methodology and tool for the common and harmonised assessment of all EU-funded activities.

As aforementioned, the projects were required to answer an ENACT survey regarding their perceived pathways to market in order to provide a baseline for analysis, as well as understand pre-existing barriers. The survey mirrors many of the questions that the ENACT Validators will answer in order to have a direct comparison regarding the gap between the perception of practitioners and the developers.

The final piece of the Validation Facility is the responses from the expert practitioners ENACT has seconded to use their expertise and knowledge to validate whether a solution/innovation is fit for an operational purpose and to highlight any areas for improvement. This feedback is of vital importance to research and innovation (R&I) projects, as these practitioners are often the end-users who will decide whether or not to invest in or purchase these solutions. Therefore, these responses should serve as a guide for future improvements.

The following paragraphs summarise the results of the nine projects the Validation Facility serviced.

CLARUS

Building clarity and preventing bias in digital forensic examination, interorganisational communication and interaction (CLARUS) is a project funded under the HE call HORIZON-CL3-2022-FCT-01-02. CLARUS aims to enhance objectivity, neutrality, and fairness in the pursuit of justice, particularly in cases involving terrorism and serious crimes that exploit digital technologies, by exploring how communication, everyday practices, organisational cultures, disciplinary backgrounds, gender, and specific languages can impact the potential for biased judgments and errors in digital evidence examination and investigation. During the course of the project, two tools have been developed for this purpose: the Clarity Checker and the Multilingual Forensic Lexicon.

The **Clarity Checker (CC)** is an intelligent writing support tool to assist practitioners in producing more clear and neutral written communications. The tool is primarily intended for use in digital forensic and investigative contexts, where the way information is communicated can significantly influence interpretation, decision making, and inter-organisational collaboration. Rather than determining whether a document is objectively biased, the CC identifies linguistic features that may unintentionally affect how a reader interprets the text, encouraging users to reflect on and improve their writing where appropriate. The system analyses user-provided text using a hybrid natural language processing (NLP) architecture that combines deterministic rule-based techniques with machine learning methods, including locally hosted large language models (LLMs) for those linguistic phenomena that require greater contextual understanding. Approximately thirty categories of linguistic indicators are supported, including emotionally charged language, absolute terms, minimising language, passive constructions, among others, that may reduce clarity or unintentionally influence the reader. Users interact with the system through a browser-based interface in which detected linguistic indicators are highlighted directly within the text. Each highlighted phrase is accompanied by an explanation describing why it was identified and, where appropriate, a suggested clarification. Results are also presented in a structured side panel that groups indicators by category and provides an overview of the analysis. The CC is designed to support human judgement rather than replace it. Users can dismiss individual detections they consider appropriate for their context, disable entire categories of indicators, and maintain personalised ignore lists that persist across future analyses.

The **Multilingual Forensic Lexicon (MFL)** is the second tool developed by the CLARUS project. The MFL is an online resource within the same browser-based interface as the CC and provides standardised definitions, real-life examples, and translations for key digital forensic terms. Essentially, the MFL provides information, about what terms mean and how they are actually used in professional practice. It was developed by analysing more than one million words of digital forensic material, including current legislation, professional guidance and training materials, interviews and focus groups with practitioners, as well as practitioner research diaries from across five European countries. Computational metrics were then used to determine key terms and candidate terms were then reviewed and validated by digital forensic practitioners who handled digital evidence as part of their main line of work. Definitions and usage examples were then drawn from actual empirical language data, in contrast to the more top-down and prescriptive design of existing lexicons in digital forensics.

Both tools currently support five languages: English, Portuguese, Czech, Finnish, and Greek, with language detection performed automatically.

VALIDATION FACILITY CONCLUSIONS

The ENACT Validation Facility assessment demonstrates that the CLARUS project has successfully developed two innovative solutions that respond to real challenges faced by digital forensic practitioners and law-enforcement organisations. Both the Clarity Checker and the Multilingual Forensic Lexicon were viewed positively by validators and show clear potential to improve communication quality, terminology consistency, and collaboration across investigative environments.

The Clarity Checker is currently the more mature of the two solutions in terms of holistic readiness. Strong technological, security, and integration readiness scores indicate that the underlying capability has been successfully demonstrated and validated in relevant environments. Nevertheless, additional work is required to strengthen commercialisation planning, legal and ethical governance, societal acceptance, and long-term deployment strategies. The project should continue to validate the solution in operational contexts while clearly demonstrating its added value relative to generic artificial intelligence-based writing tools and ensuring compatibility with secure law-enforcement infrastructures.

The Multilingual Forensic Lexicon represents a valuable knowledge resource with strong potential to support harmonisation and understanding across multilingual and multi-agency forensic environments. Although its technology readiness is encouraging, further assessment across the remaining readiness domains is necessary to establish a complete picture of its pathway to operational adoption. Future development should prioritise alignment with recognised forensic standards and terminology frameworks, while continuing to expand validation activities with practitioners and operational stakeholders.

Looking ahead, the most viable pathways to uptake involve continued collaboration with consortium end users and early adopters, additional operational testing, and participation in European exploitation and innovation-support initiatives. The project should also evaluate the suitability of dissemination routes such as the Europol Tool Repository for non-commercial deployment and consider structured exploitation support mechanisms to strengthen business planning, stakeholder engagement, and sustainability.

In conclusion, the CLARUS tools have reached a stage where their operational relevance has been demonstrated, but additional validation, integration work, and exploitation planning are required before large-scale adoption can be achieved. With targeted investment, continued practitioner engagement, and a stronger focus on market uptake and sustainability, both solutions have the potential to become valuable assets for the European law-enforcement and digital forensics communities.

MARIT-D

The **Multi AI Realtime Intelligence Tool project** (MARIT-D) is an ISF-funded project (grant agreement n° 101114216) that ran until March 2026. The Netherlands Police and several security partners have in recent years initiated and tested an intelligence-led and data-driven approach to gain a better grip on the transport component of maritime trafficking. This baseline tool has been refined and tested to reveal deviant and/or suspicious shipping movements that may be linked to maritime trafficking. The hot spots (clusters of frequently recurring locations) of these deviant shipping movements were exactly located at the border of Belgium and the Netherlands. That is why in the MARIT-D project the Dutch, Belgium, French, Portuguese and Spanish authorities have joined forces in aiming for more effective and seamless Law Enforcement in the area of trafficking at their borders, relying on the abovementioned tool as the linking pin. A critical bottleneck in the approach in the fight against trafficking is the lack of cross-border collaboration between EU-countries and Law Enforcement in particular. Fighting international organised crime groups is a vastly complex and difficult task with many of the individual member state's authorities and agencies involved (police, border police, tax authorities, private security companies, etc.), each with their own tools, processes, and structures.

That is why the MARIT-D project, as a first decisive step toward closer pan-EU collaboration, is taking the necessary steps in disrupting illicit trafficking in Europe by working closely together and by further harnessing and extending this intelligence-led and data-driven approach. In this project we will further develop the method and technology of MARIT, addressing current and new modus operandi and using current and new sensors and data sources, over the next two years based on joint use cases and field pilots. Our resulting MARIT-D tool, expert findings and lessons learned will be disseminated and made available. EUROPOL's Innovation Lab has agreed to make MARIT-D accessible to all EU Member States after the project, through the EUROPOL Tool Repository (ETR). And as discussed with the European Clearing Board (EuCB) we will explore if a new Core Group can be established parallel to the MARIT-D project that will function as an Advisory Board with interested LEAs from other Member States. In this way the project results will more effectively and easily find their way after the project life cycle to the Member States' operational units in fighting maritime trafficking.

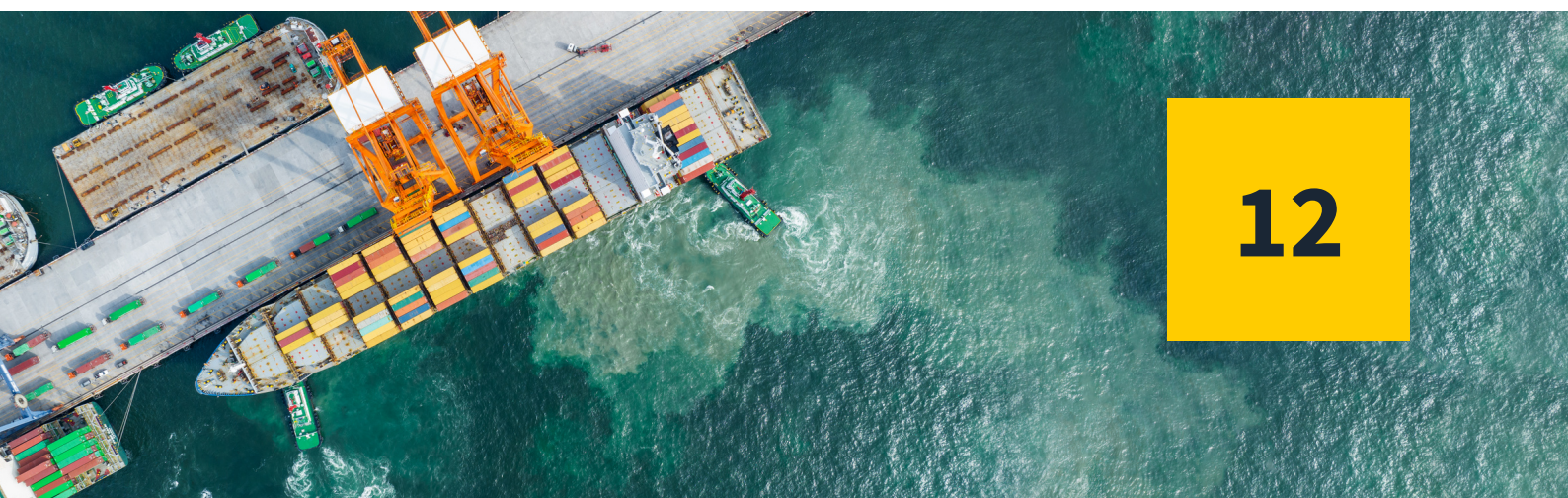
VALIDATION FACILITY CONCLUSIONS

ENACT's validation of the MARIT-D tools affirms their high technological potential in combating maritime trafficking and strengthening cross-border law enforcement collaboration. The tools' solid technical foundations and successful demonstrations in controlled environments reflect their readiness to progress toward operational deployment. However, the path to full market uptake is marked by critical challenges, particularly in security, integration, and real-world adoption.

Validator feedback underscores the need for automated features, advanced AI-driven analytics, and seamless interoperability with existing systems. The reluctance of countries to share sensitive data remains a persistent barrier, limiting the tools' ability to deliver transformative operational value. While the tools are already being used in limited operational settings such as SPR by the Netherlands Police, their scalability and effectiveness depend on addressing these gaps.

The MARIT-D consortium's commitment to open-source distribution via Europol's ETR and the establishment of a European Clearing Board Core Group demonstrate a strategic approach to overcoming market barriers. By securing additional funding for real-time data fusion and AI/ML enhancements, and leveraging the BOOSTER 'Go-to-Market Support' Service, the project can accelerate its journey toward operational maturity.

The way forward is clear: finalize last-mile development, expand operational validation, and foster cross-agency collaboration to ensure Ocean Guard and SPR achieve their full potential as indispensable tools in the fight against maritime trafficking. With these steps, MARIT-D can pave the way for scalable, impactful solutions that empower LEAs across Europe.



VANGUARD

The **Vanguard** project, funded by HE under grant agreement No. 101121282, was conceived in response to a critical gap in the market for precise, timely analysis of large volumes of heterogeneous data to combat Trafficking in Human Beings (THB). Online environments, including web and social media platforms, as well as physical border checkpoints, generate vast amounts of information that can support investigations, provided that this information is processed, correlated, and presented in an accessible and operationally relevant way.

To address this challenge, the project aimed to develop and expand the market reach of the VANGUARD ToolSuite, designed to strengthen the operational capabilities of police and border guard authorities. It is a scalable suite of tools that combines advanced sensors with innovative Artificial Intelligence (AI)-based methods to support the analysis of content obtained from a wide range of heterogeneous sources, enabling the detection, investigation, assessment, and prevention of potential THB incidents. The ToolSuite capabilities are content acquisition, multilingual text analysis, multimedia analysis, pattern recognition and correlation, risk assessment, and predictive analytics.

In the long term, the project aims to enable police and border guard authorities to transform fragmented, heterogeneous data into coherent intelligence and timely, operationally relevant decisions against THB.

VALIDATION FACILITY CONCLUSIONS

The validation of the VANGUARD ToolSuite within the ENACT Validation Facility confirms both its strong operational relevance and high functional value for intelligence gathering and forensic investigations, while also clearly outlining the key steps required to achieve full market deployment. While a complete MultiRATE self-assessment was not available at the time of the event, the baseline pathways-to-market survey and expert feedback provide a clear picture of the solution's current maturity and hurdles.

The evaluation highlights a notable convergence regarding the tool suite's operational benefits: both developers and expert validators recognise its significant potential to increase performance, save time, and foster collaboration across law enforcement workflows. Usability feedback is similarly positive, indicating that end-users find the system well-integrated and relatively easy to master without requiring excessive technical support.

However, a small divergence emerges between the project's self-assessment and the practical constraints highlighted by external validators. While the development team initially estimated deployment barriers—such as legacy system integration, interoperability, and legal/ethical concerns—to be low to moderate, the expert validators identified these areas as more important obstacles (cf data protection and integration in a generic CMS).

Furthermore, both project leads and validators unanimously agree on the need for further research, additional testing, and intensive last-mile product development.

Overall, the VANGUARD Tool Suite can be considered a functionally promising and operationally relevant solution whose pathway to market now depends on securing additional investment, establishing strict legal and data governance safeguards, and executing targeted last-mile integration to ensure seamless adoption.

INNOVATION UPTAKE AND EXPLOITATION PATHWAYS

The Pathways to market reports and studies are ENACT products that will support FCT R&I projects by providing recommendations for further marketability, identifying (innovative) pathways to uptake, and even providing recommendations based on the validation results, performed as part of the ENACT validation service (conducted by the ENACT pool of experts) of the developed FCT solutions.

THE VALLEY OF DEATH INNOVATION CHALLENGE

The "Valley of Death" in innovation is the critical funding and resource gap between initial scientific research (proof-of-concept) and a commercially viable product. Public grants usually end after laboratory testing, while private investors demand market proof, leaving promising technologies stranded without support.

Causes of the Gap

- Funding mismatch: Public money (grants or other donations) stops at early prototypes, while venture capital waits for stable revenue streams.
- Scaling complexity: Small lab tests do not easily translate to massive, reliable industrial production and effective operational support at end-user practitioners organisations.
- Skill gaps: Most FCT consortium partners (researchers, technical developers and practitioners often lack expertise in business strategy, legal compliance, and market scaling.

The Valley of Death for most FCT R&I funded innovation projects is reached at the end of the project life cycle when TRL 5, 6 or 7 is accomplished. Which is often the beginning of the product life cycle. Bridging the Valley of Death.

To bridge the gap between research and market entry, projects can deploy several strategic instruments that reduce risks for investors and increase operational readiness:

- **Deployment of validation facilities:** Facilities such as the ENACT Validation Facility play a crucial role in mitigating risks by subjecting innovative solutions to realistic pilot tests with expert practitioners and end-users. This ensures early validation in an operational context, which is essential for advancing to TRL 7 or higher.
- **Holistic readiness assessment:** The use of frameworks like MultiRATE makes it possible to look beyond just technological maturity (TRL). By systematically evaluating dimensions such as integration (IRL), commercialisation (CRL), and societal readiness (SocRL), consortia gain an integral view of the remaining barriers to market acceptance. Also, the Business Readiness Levels (paragraph 4.3) will provide better preparedness for a successful market entry of the solution at hand.
- **Result-oriented exploitation strategies:** 'Pathways to Market' (PtM) reports provide a strategic shift toward concrete market introduction by making specific recommendations on licensing intellectual property, forming joint ventures, or engaging support services like the Horizon Results Booster. This approach helps identify early adopters and unlock follow-on funding beyond traditional research grants.
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Ultimately, successfully navigating this transition requires more than just technical success; it demands the deliberate alignment of technological, commercial/business, and operational readiness. Only by synchronising these diverse elements can an innovation achieve long-term sustainability and meaningful impact that extends far beyond the initial project phase, ensuring that valuable research results are transformed into resilient, real-world solutions

PATHWAYS AND SUPPORTING TOOLS

It is only at TRL 9 where a solution has grown from prototype and tested/validated tool to a product that is ready for market uptake, provided other aspects of a product (beyond functionality and customer compliance) have been realised.

Over the past years, European agencies and institutions have worked on websites, tools, knowledge bases, accelerators and more to support, teach, inform funded project consortia about how to exploit and better be prepared for the post-project phase with the targeted Innovation/Market uptake in reaching TRL 9.

TRL 9 is the highest step on the Technology Readiness Level scale. It means a new technology is fully mature, tested, and proven to work in real-world use. The product or system is ready for regular commercial production, routine operations, or daily mission use.

What does TRL 9 mean?

- The technology works in actual operational conditions.
- It passes all tests for real-world tasks.
- Industry, SMEs and/or Spin-offs make and sell it as a regular product.
- It moves past tests and trial phases.

Some of the available instruments are listed below in no particular order:

- The **BOOSTER ‘Go-to-Market Support’ Service**. The service aims to help projects to focus on different aspects such as increasing the maturity level of Key Exploitable Results (KERs), developing effective business plans to facilitate market access and impact, and identifying opportunities for further exploitation or reuse of research results.
<https://www.horizonresultsbooster.eu/ServicePacks/Details/55>
- If the tool/solution focuses on LEAs, Border Guards and forensic agencies as end-user the consortium can also decide to make the tool/solution available for other EU LEAs and Forensic Agencies via the **Europol Tool Repository (ETR)**. ETR is only for non-commercial tools. ETR is part of the Europol Innovation Lab: <https://www.europol.europa.eu/how-we-work/innovation-lab>
- The **European Commission’s Research Executive Agency (REA)** has released a new starter kit designed to help Research and Innovation (R&I) projects make the most of their results under Horizon Europe. The practical guide provides essential tools, explanations, and examples to support projects in maximising both the economic and societal impact of their work through effective Dissemination and Exploitation (D&E) activities. The starter kit can be found at: <https://op.europa.eu/en/publication-detail/-/publication/51daa317-afc0-11f0-b37f-01aa75ed71a1/language-en>
- Another option could be to connect with the **EACTDA repository** and follow the EACTDA methodology concerning market uptake, licensing schemes and overall support.
<https://www.eactda.eu/index.html>
- The **European Innovation Council** has developed EIC Business Acceleration Services (https://eic.ec.europa.eu/eic-funding-opportunities/bas_en). The EIC Business Acceleration Services (BAS) are built to unlock the full potential of EIC-backed innovations and help you achieve market leadership. From finding your first corporate partner to expanding into global markets, we provide hands-on support at every stage so that European innovations don't stop at the lab door.
- Apply for additional post-project funding via **Europol’s Low Value Grant**. Additional research and development can be funded (max EUR 60.000) and tested with shared confidential test or real-world datasets in the new Sandbox environment at Europol’s premises in The Hague to comply with any legal issues.

BEYOND TRL 9

Reaching TRL 9 doesn't guarantee the developed solution/product will be successful. Having a product is only one aspect of a successful marketing mix. The marketing mix refers to the various elements of your business that helps an organisation to put your product, solution or service in the right place, at the right time, with the right price. The marketing mix is primarily connected to the 4Ps elements of marketing, and the 4Cs theories, formed in the 1990s, are based on the 4Ps elements of marketing.

The Marketing 4Ps was developed by the marketing expert named E. Jerome McCarthy in the 1960s, and has been used throughout the world as the basic concept of marketing. It is also the foundation for the marketing mix.



Fulfilling a proper marketing mix requires significant investment beyond product development, which often goes beyond the funded part.

The 4Cs model is a modification of the 4Ps marketing mix model. It's not a basic part of the marketing mix, but an expanded version of it.

4Ps to 4Cs	
Product	Customer value
Price	Cost
Place	Convenience
Promotion	Communication

1) Cost: Price is not the sole cost being incurred when purchasing a product or service. It may be the cost you incur to satisfy a consumer, so the cost of time, the cost of conscience or opportunity cost are also elements of the cost

2) Consumer: You should only sell a product or service that addresses your consumer demand. Therefore, you carefully research your consumers' needs and wants. So that you can give valuable products and services to your consumers with a Unique Selling Proposition.

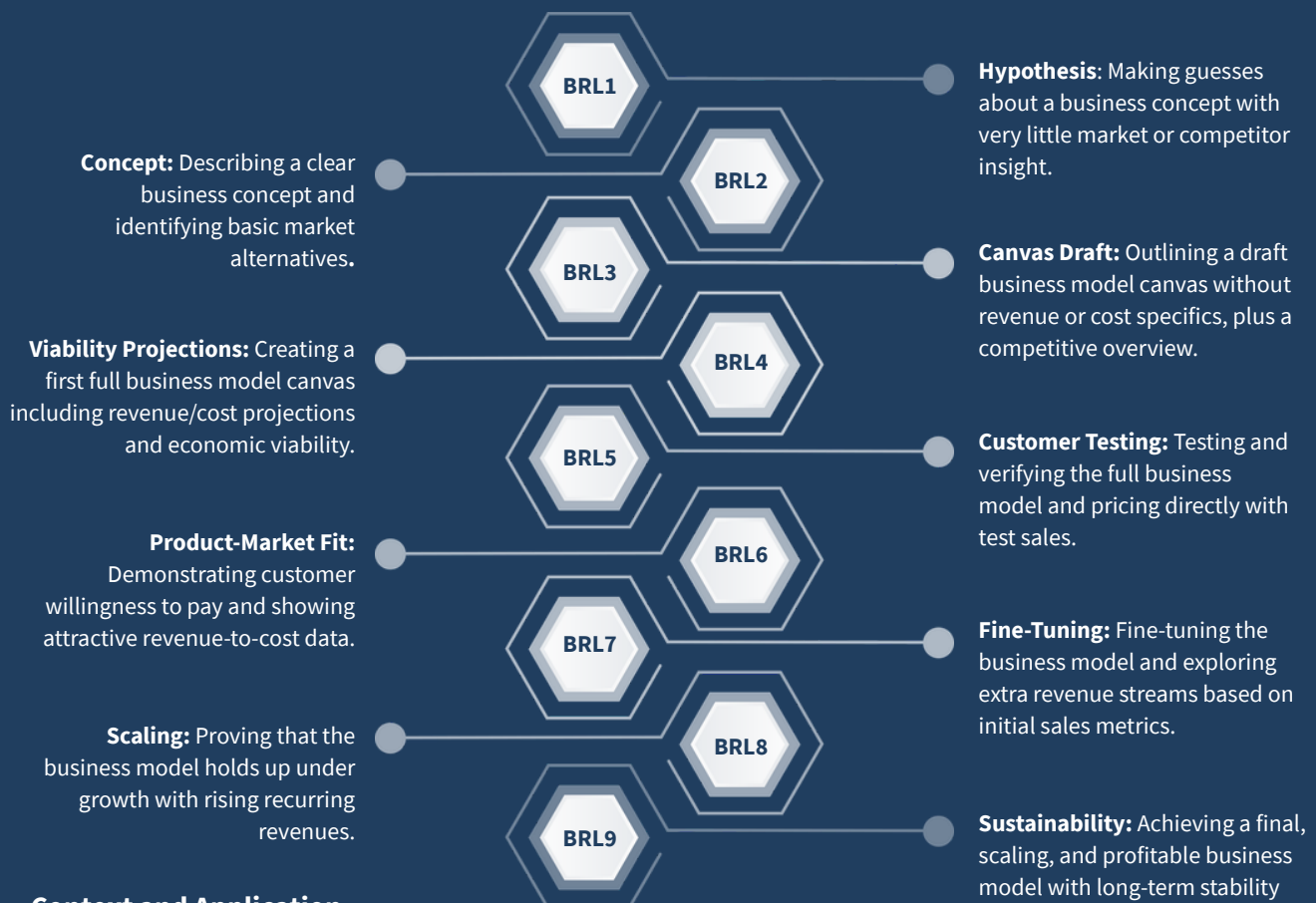
3) Communication: Based on the needs and wants of your customers, you need to create open communication with your customers because your customers want to be engaged with meaningful interactions to understand your products and services.

4) Convenience: Usually, consumers are looking for products and services readily available to them. Thus, while marketing, you should strategically place your products or services in several visible distribution points that are convenient to your consumers. In simple words, make it convenient for your consumers to buy.

Business Readiness Levels (BRL)

Next to the TRL scheme a useful guideline for Innovation/Market update could be the so-called BRL (Business Readiness Levels)

Business Readiness Level (BRL) is a 9-stage scale used to measure the commercial and market maturity of an innovation project. It complements the technical Technology Readiness Level (TRL) scale by tracking how well a business model, pricing strategy, and revenue path are validated, moving from a basic hypothesis (BRL 1) to a scaling, profitable business (BRL 9).



Context and Application

- **Relation to TRL:** While TRL tracks whether a product works from the lab out, BRL tracks whether people will actually pay for it and if the venture can survive financially.
- **Broader Frameworks:** BRL is often paired with other indicators like Customer Readiness Level (CRL) and Team Readiness Level (TMRL) in comprehensive innovation tools like the KTH Innovation Readiness Level framework <https://kthinnovationreadinesslevel.com/>.
- **Funding Use:** Agencies like the European Innovation Council (EIC) use BRL benchmarks to decide if a startup is ready for commercial-stage accelerators.

CONCLUSIONS & FUTURE WORK

This report has introduced a comprehensive methodology for ENACT's Pathways to Market (PtM) initiative, which aims to guide FCT R&I projects through their innovation uptake journey. The methodology consists of three key components:

1) Expert validation process:

- Structured surveys conducted by qualified validators from the expert pool
- Assessment of operational validity and market readiness
- Mapping solutions to the EUCS taxonomy for precise market positioning
- Evaluation of technical performance and user experience

2) Project Self-Assessment Framework:

- Detailed questionnaires for project teams to identify barriers and opportunities
- Integration of preliminary exploitation plans (if available)
- Structured interviews for deeper insights into commercialisation strategies
- Analysis of Key Exploitable Results (KERs) and their potential impact

The methodology's dual perspective approach enables:

- Comprehensive market opportunity assessment
- Identification of potential commercialization/uptake challenges
- Strategic alignment with industry standards and certifications
- Clear pathways for market entry and growth

3) Continuous Improvement Strategy:

As ENACT implemented this framework within the ENACT validation facility, ENACT will continuously refine our approach based on real-world feedback and results. This iterative process ensures our methodology remains current and effective in supporting civil security innovations. These continuous improvement iterations, throughout the course of the ENACT project phases, will lead to a final guidance document for all projects/solutions based on the ENACT findings with respect to the Pathways to Market and the Innovation uptake process.

Future Post-Project Development Priorities:

- Enhancement of survey instruments with detailed validation metrics
- Development of comprehensive assessment guidelines to address validator-project perspective gaps
- Implementation of quantitative impact measurement systems
- Creation of an extensive database documenting successful market entry strategies
- Integration of market trend analysis tools
- Development of standardised reporting templates



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