



SMART ERA

SMART ERA

1ST OPEN CALL FOR PILOTS ADD-ONS

GUIDE FOR APPLICANTS

Submission of applications starts:	August 28th, 2025 at 9.00 Brussels time
Submission deadline:	November 4th, 2025 at 15.00 Brussels time



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Acronyms

Acronym	Description
EU	European Union
GfA	Guide for Applicants
IPR	Intellectual Property Rights
OC	Open Call
SIPs	Smart Innovation Packages
SMEs	Small and Medium - sized Enterprises
TRL	Technological Readiness Level



1. Basic info about SMART ERA

SMART ERA is an EU-funded project that aims to transform rural areas by addressing their socio-economic and environmental challenges through advanced technology and innovative solutions.

SMART ERA impacts will span across technology, governance, business, society, and policymaking, fostering sustainable development and growth.

The 6 Pilot Regions leading the way are:

-  [Val di Sole/Trentino, Italy](#)
-  [Tramuntana/Sóller, Spain](#)
-  [Northern Ostrobothnia, Finland](#)
-  [Trebinje/East Herzegovina, Bosnia and Herzegovina](#)
-  [Šmarje-Padna, Slovenia, Italy, Croatia](#)
-  [Devetaki Plateau, Bulgaria](#)



They will become smart villages through the application of [Smart Innovation Packages](#) (SIPs) co-designed and validated with local communities. Joint efforts can revitalize rural communities, combat depopulation, and create resilient, vibrant societies.

[The SMART ERA consortium](#) brings together 25 organisations from 10 countries, counting with the adequate resources for achieving the project objectives.

During its duration, SMART ERA will launch 2 Open Calls to enlarge the uptake of social innovation procedures developed in the project, from co-design methodologies to the SIP integration. Through this **1st Open Call for Pilots Add-ons**, SMART ERA will select **up to 11 Technology/Solution Providers to develop innovative solutions** to solve the detected gaps and needs for the 6 Pilot Regions.

Where can you find key information regarding this Open Call?

- This Guide for Applicants is the main document including the most important requirements that must be met by applicants.
- SMART ERA application system: [SMART ERA 1st OC](#)
- If you have any technical problems or doubts when filling in the online Application Form, tell us directly at: SMARTERA.help@fundingbox.com, or post your questions in the SMART ERA Helpdesk in Discord. Here you can find out [how to access the Community](#). Some webinars about the OC will be organized and announced throughout the Community.

2. What do we offer?

The SMART ERA 1st Open Call for Pilots Add-ons will select up to 11 individual entities acting as Technology/Solution Providers **to develop innovative solutions** in one of the 6 Pilot Regions of the SMART ERA Project.

Applicants have to focus on **addressing one of the Challenges that SMART ERA Consortium has defined for the 6 Pilot Regions** (described in [Section 3.2](#)).

The initial idea is to select 1 project per Challenge, but finally, it would depend on the quality of the proposals received and the alignment with Challenges as described in Section 3.2.

Each individual Technology/Solution Provider selected under the SMART ERA 1st Open Call will receive **up to € 60,000 and a 9-month Support Programme** with the mentoring from SMART ERA Technical Partners. The Support Programme includes the following stages:

- **Stage 1: On-boarding Phase**, during which the beneficiary should deliver an **Individual Mentoring Plan** (including planned activities, KPIs, milestones and budget) and a **Design Report**. The duration of this stage is up to **2 months** and, after completing it, the beneficiary will receive up to **€10,000**.
- **Stage 2: Deployment Phase**, which should lead to a **Technical Solution Completed**. The duration of this stage is up to **7 months** and, after completing it, the beneficiary will receive up to **€50,000**.



3. Eligibility Criteria

To participate in the SMART ERA Support Programme, Applicants have to meet all the criteria described in Section 3 of this Guide, positively pass our Evaluation Process and finally sign the Subgrant Agreement with the SMART ERA Consortium.

The projects that do not comply with the criteria described in this section will be excluded. We will check the eligibility criteria during the whole evaluation process.

3.1. Who are we looking for?

We are looking for **individual legal entities** that must act as **Solution/Technology Providers**. These individual legal entities should be legally registered on the day of application submission in any of the following countries:

- [The Member States of the European Union](#)¹ and its Overseas Countries and Territories (OCT) or
- [Associated Countries \(AC\) to Horizon Europe](#)².

The applicants who are subject to [EU restrictive measures](#) under Article 29 of the Treaty on the European Union (TEU) and Article 215 of the Treaty on the Functioning of the EU (TFEU)³ are not eligible to participate in this Open Call.

3.2. What types of activities can be funded?

The activities that qualify for financial support under the SMART ERA 1st Open Call for Pilots Add-ons should focus on the deployment of innovative solutions that address the identified gaps and bring value to the SMART ERA Pilot Regions.

¹ Following the Council Implementing Decision (EU) 2022/2506, as of 16th December 2022, no legal commitments can be signed with Hungarian public interest trusts established under Hungarian Act IX of 2021 or any entity they maintain. Affected entities may continue to apply to calls for proposals. However, in case the Council measures are not lifted, such entities are not eligible to participate in the SMART ERA Open Call.

² AC as of 15.07.2025: Albania, Armenia, Bosnia and Herzegovina, Canada, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Tunisia, United Kingdom, Ukraine, for the most up-to-date list please see first part of this [document](#).

³ Please note that the EU Official Journal contains the official list and, in case of conflict, its content prevails over that of the EU Sanctions Map.

Applicants must reply in the proposal to one of the following Challenges defined by the SMART ERA Consortium (Details in [Annex 1](#)):

- **Challenge #1: Information system for tracing agrifood production** (Val di Sole)
- **Challenge #2: Information system for Pasture ecosystem monitoring** (Val di Sole)
- **Challenge #3: AI Chatbot for personalized touristic experience** (Sóller/Tramuntana)
- **Challenge #4: AI tool for micro-farming management** (Sóller/Tramuntana)
- **Challenge #5: SMART Economy Service Platform** (Northern Ostrobothnia)
- **Challenge #6: AI-Assisted Conceptualization of Rural Businesses Based on Deep Local Knowledge** (Northern Ostrobothnia)
- **Challenge #7: Smart B2B platform for the agro-tourism sector** (East Herzegovina)
- **Challenge #8: SMART platform for personalized tourism experience** (East Herzegovina)
- **Challenge #9: Mobile App for mobility on demand** (Šmarje-Padna)
- **Challenge #10: AI GP Support System** (Devetaki Plateau)
- **Challenge #11: Map-based digital platform for tourist information, promotion and tailor made trips** (Devetaki Plateau)

Solutions, at the moment of applying, must have an Initial **Technological Readiness Level**⁴ (TRL) of at least 4 and achieve a Final TRL of at least 6.

The digital solution must implement **robust security measures**, including data encryption (if needed) at rest and in transit, user authentication and authorization mechanisms, regular vulnerability assessments, and compliance with relevant security standards such as ISO/IEC 27001.

Solutions developed through the SMART ERA Support Programme should be compliant with the SMART ERA data management plan for a FAIR and privacy-respecting management of collected data and all relevant European regulations regarding the **General Data Protection Regulation** (GDPR).

⁴ TRL - Technology Readiness Level - Technology Readiness Levels (TRLs) are indicators of the maturity level of particular technologies. This measurement system provides a common understanding of technology status and addresses the entire innovation chain. There are nine technology readiness levels; TRL 1 being the lowest and TRL 9 the highest. In our project, we refer to Annex B of the https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf#page=10 for a full description of TRLs.



Projects selected through the SMART ERA Open Call should have a clear **European Dimension**, which means that the Innovative Solution aims to fully exploit the potential of the European economy and society, contributing to EU policies (like the Green Deal or Europe's Digital Decade). The supported activities should strengthen the EU values and help address societal challenges. Also, the solutions should have the capacity to be replicated in other EU regions.

Applicant should also consider the following:

Where applicable, beneficiaries of the SMART ERA Open Call should comply with the **SMART ERA Integration & Interoperability Methodology** included in [Annex 2](#) of this Guide for Applicants.

Projects selected through the SMART ERA Open Call are, where applicable, encouraged to use **Open-Source** AI models and/or apps with free or reusable licenses that are aligned with SMART ERA principles.

Projects selected through the SMART ERA Open Call are, where applicable, encouraged to use the **OpenAPI approach**.

Where applicable, beneficiaries of the SMART ERA Open Call are encouraged to provide the **output data as free of charge**, to be published in the open data portals.

3.3. Ground rules

When applying to the SMART ERA Open Call, Applicants should note that:

- **Be on time and use our system:** only proposals submitted through [the online form](#) before the deadline (November 4th, 2025, 15.00 Brussels time) will be evaluated and considered for funding. If applicants submit the form correctly, the system will send a confirmation of the submission. Contact us if it is not the case.
- **English Language:** proposals must be written in English in all mandatory parts to be eligible. Only parts written in English will be evaluated. If the mandatory parts of the proposal are in any other language, the entire proposal will be rejected. If only non-mandatory parts of a proposal are submitted in a language different from English, those parts will not be evaluated but the proposal is still eligible.
- **Every question deserves the applicant's attention:** all mandatory sections - generally marked with an asterisk - of the proposal must be completed. The data provided should be actual, true, and complete and should allow assessment of the proposal. Additional material, not specifically requested in the online application form, will not be considered for the evaluation.

- **Be exhaustive:** Applicants have to verify the completeness of the form, as it won't be possible to add any further information after the deadline. After the proposal is submitted, it could be modified until the deadline.
- **Conflicts of interest:** the existence of a potential conflict of interest among Applicants and one or more SMART ERA Consortium partners will be taken into consideration. Consortium partners, their affiliated entities, employees, or persons treated as personnel (ex. working under B2B contract) cannot take part in the SMART ERA Support Programme. All cases of potential conflict of interest will be assessed case by case.
- **Healthy finances and a clean sheet are a must:** SMART ERA OC don't accept entities that are under liquidation or are an enterprise under difficulty⁵ according to the Commission Regulation No 651/2014, art. 2.18, or that are excluded from the possibility of obtaining EU funding under the provisions of both national and EU law, or by a decision of both national or EU authority. Also, entities that are meeting national regulations regarding bankruptcy aren't accepted.
- **It is your proposal:** Proposals should be based on applicant's original work or their right to use the IPR must be clear. Any work related to the implementation of the project described in the application may not violate the IPR of third parties, and the IPR of the application project may not be the subject of a dispute or proceedings for infringement of third-party IPR.
- **Subcontracting:** Please note that subcontracting is allowed but for small tasks and amounts (below 15% of total costs). Beneficiaries cannot subcontract any main task within their project. Each case will be assessed individually when developing the Individual Mentoring Plan.
- **Multiple submissions:** Though applicants could submit two applications to different Challenges, **legal entities cannot be funded twice by SMART ERA.** In the case that more than one proposal from the same applicant will be among the projects selected for funding after the "Pitching day and Final Consensus Meeting stage", only the best-ranked one will be funded (the proposal which is placed higher on the different ranking lists per

⁵ An enterprise will be considered an undertaking in difficulty if more than half of the capital has disappeared. This refers to the loss of "subscribed share capital". If profit and loss reserves deficit more than 50% of share capital, there is a potential problem with the company. (Article 2, item 18 point a) and b)

(a) In the case of a limited liability company (other than an SME that has been in existence for less than three years [...]), where more than half of its subscribed share capital has disappeared as a result of accumulated losses. This is the case when deduction of accumulated losses from reserves (and all other elements generally considered as part of the own funds of the company) leads to a negative cumulative amount that exceeds half of the subscribed share capital. For the purposes of this provision, 'limited liability company' refers in particular to the types of company mentioned in Annex I of Directive 2013/34/EU (1) and 'share capital' includes, where relevant, any share premium

(b) In the case of a company where at least some members have unlimited liability for the debt of the company (other than an SME that has been in existence for less than three years [...]), where more than half of its capital as shown in the company accounts has disappeared as a result of accumulated losses. For the purposes of this provision, 'a company where at least some members have unlimited liability for the debt of the company' refers in particular to the types of company mentioned in Annex II of Directive 2013/34/EU.

Please note that, if your SME exists for less than three years, you won't be considered as undertaking any difficulties.

Challenge). If both proposals are placed in the same position on different ranking lists (e.g. on the 1st position), the proposal funded will be the one with the higher total score received after the Consensus Meeting stage.

Applicants are permitted to submit a maximum of 2 proposals, with the condition that each proposal addresses a distinct Challenge offered by SMART ERA. This means, if you submit one, distinct proposal for each Challenge, you can submit up to 2 proposals in total. If more than one proposal to the same Challenge is submitted by the same Applicant, only the last proposal which has been submitted in order of time will be evaluated. If more than 2 proposals are submitted by the same Applicant, only the last two proposals submitted in order of time will be evaluated.

- **Gender Equality Plan:** public bodies, higher education institutions, and research organisations from EU countries and associated countries must have a Gender Equality Plan (GEP)⁶.
- **Acceptance of the Open Call rules:** to apply for this Open Call, Applicants have to accept its rules and regulations detailed in this Guide for Applicants.

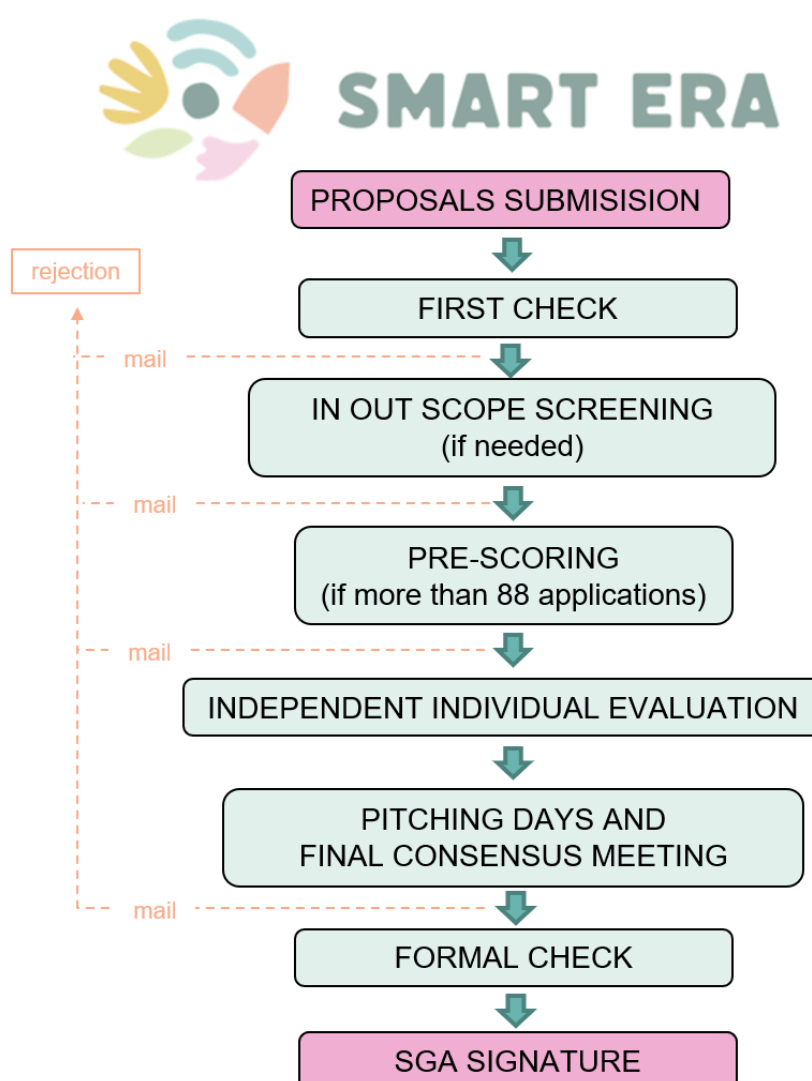
⁶ For more details please check: https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/democracy-and-rights/gender-equality-research-and-innovation_en



4. How will the proposals be evaluated?

SMART ERA evaluation process is transparent, fair and equal to all the participants with a clearly defined complaint procedure (see section [Complaints](#)).

The projects will be evaluated in several phases indicated in the Figure below. Applicants are encouraged to put in the effort to present their projects in the best possible way, offering as much detail as possible.



4.1. First check

After the closure of the Open Call, proposals will be reviewed to ensure they meet the conditions outlined in [Section 3](#). This assessment will be based on the statements provided in the proposals.

At this stage, the eligibility criteria are checked against the Declaration of Honour or self-declarations included in the application form, and they will be continuously verified throughout the evaluation process, including the final formal check.

Projects that do not comply with the above-mentioned criteria will be rejected. We will inform applicants about the results of this initial check.

As a result of the checking, a 'List of Eligible Applications' will be produced.

4.2. In/Out Scope Screening

In case of a large number of applications, or special needs of the SMART ERA project, the Selection Committee might decide to apply the In/Out Scope Screening.

To maximise the impact within the framework of SMART ERA, proposals must be aligned with the scope of activities outlined in [Section 3.2](#) and provide a clear demonstration of this alignment.

The overall summary/general objectives of all proposals included in the 'List of Eligible Applications' will be reviewed to evaluate the following items:

- **Scope.** The objectives of the proposal must fit within the scope of the project as it is described in this Guide for Applicants.
- **European Dimension.** The project should have an European dimension as it is described in [the Guide for Applicants Section 3.2](#).

Each proposal will be reviewed by one partner from the Selection Committee and, once reviewed, the Selection Committee will check and discuss the ones proposed to be excluded, generating an 'In Scope List'.

Proposals that do not comply with all the requirements described above will be excluded. The ones complying with all of them will move on to the next evaluation phase. We will inform the Applicants about the results of the in/out scope screening.

4.3. Pre-scoring

A pre-scoring system may be applied if, after the previous evaluation stage, the number of eligible proposals exceeds 88 eligible proposals, in which case, the eligible proposals will be automatically scored by the FundingBox Open Call Management System according to the following criteria:

- **Excellence** (up to 20 points): Current and expected to achieve Technological Readiness Level.
- **Impact** (up to 20 points): Relation with the Pilot Region and Knowledge of the Language of the Pilot Region.
- **Implementation** (up to 40 points): Use of Open Source Solutions, Experience working in Rural Areas and in the Pilot Region of the Challenge and Gender Balance.

Applicants should:

- select the option that best describes the characteristics of their project in relation to each criterion in the application form,
- confirm that no false declarations are made.

In total, projects can get **up to 80 points** at the pre-scoring stage and as a result of this phase, up to 8 of the top-ranked Applications per Challenge will be forwarded to the next phase (up to 88 Applications in total).

Once the initial ranking per Challenge (11 ranking lists) is created, ties (if any) will be solved using the following criteria in order of priority:

- The highest score in the Implementation Section.
- Gender balance among the personnel responsible for carrying out the activities (the team with higher % of females will be prioritised).

4.4. Independent Individual Evaluation

In this phase, each proposal will be evaluated by 3 independent External Experts, appointed according to the specific characteristics of the Applicants from the pool of External Experts.

The External Experts must be independent from the applicants and cannot be SMART ERA Consortium partners employees, permanent collaborators, nor board members.

The projects will be evaluated within the following awarding criteria:

(1). EXCELLENCE will evaluate:

- **Ambition.** Applicants need to show how their project contributes to the overall SMART ERA scope, goes beyond the current state of the art, has a European dimension, and addresses the needs of the identified regions. In addition, they should outline the innovative approach of their project (e.g. groundbreaking objectives, novel concepts and approaches, new products, services, or business and organizational models).
- **Innovation.** Applicants should explain how the project will innovate the sector and describe the differentiation the project will bring to the region.
- **Soundness of the approach.** Applicants should provide concrete and verifiable arguments and/or evidence that demonstrate the soundness of the approach and credibility of the proposed methodology for solving the challenge.
- **Gender dimension.** Applicants must illustrate the level to which the gender dimension is incorporated within the innovation content.

(2) IMPACT will analyse:

- **Impact within SMART ERA.** Applicants have to demonstrate a clear idea of what they want to do and whether the new/improved solution for rural innovation has potential for integration in the SMART ERA Smart Innovation Packages for ensuring its impact.
- **Impact in the Region.** Applicants have to demonstrate a clear understanding of the regional area where the project will be developed, for ensuring the impact and capabilities to cover the region's needs and challenges.
- **Strategy for Sustainability.** Applicants have to demonstrate the level of scalability of the new/improved product, meaning that it does not address only a specific problem but can be commercialised to solve a structural problem in the sector of interest, and be applicable to other regions.
- **Environmental and social impact.** Applicants have to demonstrate the project contribution towards environmental, social and economic impacts to contribute to sustainable development, Green Deal and other regional and European policies.

(3) IMPLEMENTATION will consider:

- **Team.** Applicants have to demonstrate their team's management and leadership qualities, their ability to uptake the SMART ERA methodology, their capacity to carry through their ideas, and their understanding of the dynamics of rural innovation they are trying to tap into. The team should be a cross-functional team, with a strong technical background and skills base, and should take gender balance into account.

- **Resources.** Demonstrate the quality and effectiveness of the resources assigned in order to get the objectives/deliverables proposed, along with previous experience within the region or rural areas and in the technology to be developed.

The evaluators will score each award criterion on a scale from 0 to 5:

- 0 = Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.
- 1 = Poor – criterion is inadequately addressed or there are serious inherent weaknesses.
- 2 = Fair – proposal broadly addresses the criterion, but there are significant weaknesses.
- 3 = Good – proposal addresses the criterion well, but a number of shortcomings are present.
- 4 = Very good – proposal addresses the criterion very well, but a small number of shortcomings are present.
- 5 = Excellent – proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Each evaluator will produce an Individual Evaluation Report. Once the Individual Evaluation Reports are submitted, the final score for each individual criterion will be calculated as the average of the scores provided by each evaluator. The final score of each application will be calculated as the sum of the scores for each individual criterion.

The threshold for individual criteria will be 3 out of 5 points. The total maximum score is 15 points. The overall threshold, applying to the sum of the three individual scores, is 10 points.

Once the initial ranking per Challenge (11 ranking lists) is created, ties (if any) will be solved using the following criteria in order of priority:

- The highest score in the Impact Section.
- Gender balance among the personnel responsible for carrying out the activities (the team with the higher % of females will be prioritised).

Reviewing all proposals takes considerable time, therefore, Applicants should expect a significant wait before receiving an update on the process.

4.5. Pitching Days and Final Consensus Meeting

Following the previous step and based on the ranking lists per Challenge, the 3 best-ranked proposals per Challenge (provided that they reached all the thresholds and met all of the requirements) will be invited to pitch their project in front of the SMART ERA Selection Committee. This will happen during the on-line sessions that will be held in January 2026 (indicatively).

The SMART ERA Selection Committee, including 6 Representatives from the Pilot Regions, will decide, by minimum 2/3 of the votes, the 'Provisional List of FSTP recipients' and 'Reserve List'. The Representatives take part in an advisory capacity (i.e. with voice but without vote).

The SMART ERA Selection Committee will undertake the final evaluation and select the finalists, taking into account the following awarding criteria:

- High potential impact on the SMART ERA Project's goals;
- Vision and attitude of the Team;
- Potential for Scalability/Recreation in other rural regions.

The initial idea is to select 1 project per Challenge, but finally, it would depend on the quality of the proposals received and the alignment with the Challenges. Whilst normally the highest ranked proposals will be selected for funding, the SMART ERA Selection Committee might have fair reasons for objecting to a specific Pilot add-on project, like the alignment with SMART ERA goals and pilots' scope, the ability to achieve the highest impact possible, commercial competition, as well as the existence of significant ethical concerns or a potential conflict of interest. In this case, the choice may pass to the next-ranked proposal.

After the Final Consensus Meeting, results will be communicated to the Applicants.

4.6. Formal Check, Subgrant Agreement Preparation and Signature

Before getting started with the SMART ERA programme, pre-selected applicants need to sign the Subgrant Agreement with the SMART ERA Consortium.

Before signing the Agreement, applicants should provide documents regarding their formal status. The SMART ERA Consortium will verify them to prove the eligibility.

To confirm the organization formal status, SMART ERA may ask applicants for (not an exhaustive list): company's registration document, the legal representation (optionally POA), tax ID number, ownership structure, financial statements, document/s confirming the staff headcount, Bank Identification form, and any other documents in case of doubts raised during the checks.

Be extremely vigilant with respect to:

- **The nature of the documents requested.** If the documents provided do not prove the eligibility, the applicant's participation will end at that point.
- **The deadlines that will be given to provide the documents.** If the requested documents are not delivered on time, without a clear and reasonable justification, the applicant will be excluded from further formal assessment. Another applicant from the Reserve list will then be selected.

5. Our Support Programme and Payment Arrangements

Once the applicant's eligibility has been confirmed following the formal check and the Subgrant Agreement signed, pre-selected applicants will become official beneficiaries of the SMART ERA Support Programme.

Support Programme

The Support Programme will last up to 9 months and it is planned to start in March 2026.

At the beginning of the Support Programme, the beneficiaries will be invited to participate in an on-line Welcome Event (please note that participation in the Welcome Event is mandatory for at least one beneficiary representative) where they will be matched with the SMART ERA Mentors.

The first step of the Support Program will be the definition of each beneficiary's Individual Mentoring Plan (IMP). This document, once created and validated, will become an Annex to the Sub-Grant Agreement and will establish the budget planned for the execution of the project (eligible costs should be considered according to Horizon Europe Programme Rules), the Key Performance Indicators (KPIs) that each project should achieve and the Deliverables that will be taken into account when evaluating the projects' performance during the following stages:

- Stage 1: On-boarding Phase (2 months)
- Stage 2: Deployment Phase (7 months)

Selected grantees will receive a fixed lump sum of **up to €60,000**.

The lump sum is a simplified method of settling expenses in projects financed from Horizon Europe Programme funds. It means that the grantee is not required to present strictly defined accounting documents to prove the cost incurred (e.g. invoices), but is obliged to demonstrate that the implementation of the project is in line with the milestones set for it. Simply speaking, it means that SMART ERA will carefully assess the beneficiaries progress and the quality of their work during Interim Reviews. The milestones (deliverables, KPIs and ethical recommendations) will be fixed in the 'Individual Mentoring Plan' elaborated at the beginning of the programme.

The lump sum method does not exempt beneficiaries from collecting documentation to confirm the costs under fiscal regulations.



Payment Arrangements

The grant will be paid in the following scheme:

Stage	Deliverable	Payment Milestone	Grant
Stage 1: On-boarding Phase	Individual Mentoring Plan & Design Report	M2	Up to €10,000
Stage 2: Deployment Phase	Technical Solution Report	M9	Up to €50,000.
Total		9 months	Up to €60,000

Payment of the given tranche depends on the proper and timely execution of the work planned in the 'Individual Mentoring Plan'. The Selection Committee will evaluate your progress on a regular basis. For more details check the [SGA template](#).

Milestones Review

Beneficiaries performance during the Support Programme will be reviewed by the Technical Partners (with the support of Ethics Partners if needed) at the Milestone Review (established every time a payment is due), according to the following criteria:

For IMP:

- Deliverable quality (90%).
- Deadline Compliance (10%).

For Technical Deliverables:

- Deliverable quality (30%).
- Technical performance indicators (60%).
- Deadline Compliance (10%).

Each criterion will be scored from 0 to 10 and, based on the weight of each criterion, the final score will be calculated. The threshold to continue in the programme is 7 points. According to this final score, beneficiaries over the threshold (7 points) will successfully receive the corresponding part of the grant and continue the programme. The beneficiaries who haven't reached the threshold (7 points) will be invited to leave the programme without receiving the corresponding payments. The Selection Committee will review and validate the evaluations, putting special attention to the 'under threshold' cases, if any, by taking into consideration all possible objective reasons for underperformance (i.e. external factors which might have influenced the beneficiaries' performance).

The SMART ERA Selection Committee will make the final decision, and approve the payments or invite beneficiary projects which have not reached the threshold to leave the programme.

6. Contact us

6.1. How can we help you?

Applicants that have any questions regarding the application process can post their questions at [our Helpdesk](#) or send an email to SMARTERA.help@fundingbox.com.

Responses to any questions are provided on an individual basis, do not constitute a change to this Guide for Applicants, and are provided for informational purposes.

In case of any technical issues or problems, the following information should be included in the message:

- Applicants username, phone number and email address;
- details of the specific problem (e.g. error messages, bug description, i.e. if a dropdown list isn't working, etc.); and
- screenshots of the problem.

6.2. Complaints

If an applicant believes that a mistake has been made after receiving the results of one of the evaluation phases (when foreseen), a complaint may be submitted. To do so, applicants should email their complaint in English at SMARTERA.help@fundingbox.com and include the following information:

- contact details (including email address);
- the subject of the complaint;
- information and evidence regarding the alleged breach.

Applicants have **3 calendar days** to submit their complaint, starting from the day after the communication was sent. Complaints will be reviewed within seven calendar days from its reception. If more time is needed to assess the complaint, the applicant will be informed about the extension by email. Anonymous complaints as well as complaints with incomplete information will not be reviewed.

Please take into account that the evaluation is run by experts in the relevant field, and we do not interfere with their assessment. Therefore, we will not evaluate complaints related to the results of the evaluation other than those related to procedural or technical mistakes.

7. Final provisions

Any matters not covered by this Guide will be governed by Polish law and rules related to the Horizon Europe Programme and general rules of EU grants.

Please take into account that we make our best effort to keep all provided data confidential; however, for the avoidance of doubt, you are solely responsible for indicating your confidential or sensitive information as such.

Your IPR will remain your property.

For the selected grantees, the Sub-grant agreement will include a set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, understanding potential controls by the EC/ECA, EPPO and OLAF).

The SMART ERA Consortium might cancel the call at any time, change its provisions or extend it. In such a case we will inform all applicants about such change. The signature of the Sub-grant agreement is an initial condition to establish any obligations among applicants and any Consortium partners (with respect to the obligation of confidentiality of the application).

Did not find what you were looking for? [Contact us](#) and we will happily answer all your questions.

8. Extra hints before you submit your proposal

A proposal takes time and effort and we know it. Here are a few crucial points you should read before submitting your proposal.

- Is your project in line with what SMART ERA is looking for? You are not sure? You can consult [this section](#) and [this one](#).
- Did you present your project in a way that will convince evaluators? Not sure if you did? Go back to [this section](#).
- Is your project fulfilling all eligibility requirements described in the Guide? Check again [this section](#).
- Are you sure you can cope with our process of the Sub-grant agreement signature and payment arrangements for selected proposals? You may want to go over [this section](#).
- Did you check our Sub-grant agreement template? You didn't? Check it [here](#).

Do you need extra help? [Contact us](#).

Good luck!

Annex 1

SMART ERA 1st Open Call for Pilots Add-ons Challenges



Challenge #1

Pilot Region: Valle di Sole/Trentino, Italy

Challenge name: **Information system for tracing agrifood production**

Short description of the problem to be solved:

Valle di Sole is experiencing a gradual decline of traditional economic activities related to land use and preservation, with modest attractiveness to new generations and an economy mainly driven by tourism, which presents fragilities and stress elements. Within this context, there is a need to revive and support the economic development of local agrifood sectors that have the potential to strengthen cultural identity and resilience, as well as to value products related to natural resources and their preservation. The region is looking for methods to trace agrifood production, to provide correct information on production processes and demonstrate the product value, so as to enhance trust, understanding and loyalty in consumers. The traditional milk and cheese sector is particularly in need of an innovative information system for production tracing.

Final user of the solution:

- i. Different types of *stakeholders involved in product production and distribution*, e.g., farmers, producers, transporters, resellers, operators of the hospitality sector serving the products (hotels, restaurants and bars, private accommodation hosts). These are the users who are expected to interact with the information system to collect the tracing information and to monitor the supply chain.
- ii. *Consumers and the local community*. These are the users who interact with the information system to inspect certified information on the origin of the product and interesting facts on its quality.

Objectives/Expected Result:

The aim of this challenge is to increase the access by consumers to trustworthy information on how local milk and cheese are produced and the role of local producers, traditional methods, product safety, land use on the final quality. The objective is to provide the region with an information system that traces the production phases of local products from field to table. The collected information is to be used (i) by local producers to monitor production and (ii) by consumers to get trustable information on the origin, security and quality of products. The expected result is an innovative information system composed of integrated parts, including:

- a front-end user interface and a mobile application that allows stakeholders involved in production to easily create digital traces of each transformation or relocation step happening during the production process;
- a methodology to guarantee the authenticity of the collected traces;
- a front-end user interface for consumers to inspect the certified traces associated with each product;
- a data dashboard for producers to monitor the tracing information and retrieve data for product management purposes.

The beneficiary selected to solve this challenge will receive the support of a network of local stakeholders who have formally confirmed their availability to participate in the proposed actions and contribute to the relevant outcomes.

Requisites:

Mandatory:

- Adoption of Blockchain technology to certify the data collected at each traced step
- Adaptation of the offered solution to the existing information collection practices of the milk and cheese production chain in Val di Sole.
- Italian and English interface for the front-end / mobile application to be used to collect production traces.
- Multilingual interface (Italian, German, English) for the front-end for consumers.
- Release of an Application Programming Interface (API) of the information system to export tracing data to external applications in a standardized format.
- Availability for a limited number of travels (1-2 as a minimum) to Valle di Sole to guarantee onsite presence as necessary for system deployment, testing, and training, within the timeframe of the Support Programme duration.
- The applicant is required to present a tentative cost plan to continue maintaining the platform for two years after the end of the Support Programme (time covered by the Subgrant Agreement).

Preferential:

- Integration of data exported from the existing management software used by producers to automatically derive part of the tracing information, to avoid duplication of recording procedures.
- Possibility to import digital contents to be shown to consumers from the external Content Management System of the Egnition platform [1], for which support is available within the SMART ERA project consortium (Municipia partner).
- A final TRL for the proposed solution of at least 7-8.

Reference Info:

[1] Specifications of the Egnition CMS

Egnition is a web-based content management system developed by Municipia S.p.A., designed to manage and distribute multimedia and structured content across different digital channels, such as websites, mobile apps, and digital signage. Egnition will be used within the SMART ERA project to collect multimedia content related to Valle di Sole's milk and cheese producers and products.

Although it doesn't include native blockchain features, Egnition can easily integrate with external systems through RESTful APIs to distribute the available content. The system also includes frontend functionalities that may be used to connect with blockchain-based traceability platforms, acting as a frontend layer that displays verified production data to end users.

Further API integration details are available from Municipia's technical team if needed.

Challenge #2

Pilot Region: [Valle di Sole/Trentino, Italy](#)

Challenge name: **Information system for pasture ecosystem monitoring**

Valle di Sole needs to strengthen the connection between land management and sustainability and the cultural value of its traditional dairy supply chain. Pastures are not only ecological assets but also a foundational element in the production of high-quality local cheeses that define the region's identity. At the same time, pastures are curated green areas contributing to the beauty of the natural landscape, which is at the core of the local tourism industry.

The region needs an innovative solution to manage data and information to monitor the pasture ecosystem distribution and functioning, with the aim of understanding and quantifying the relationship between Alpine farming activities, the sustainable management of the environment, and the challenges related to working in the mountains (e.g., remoteness, altitude, weather conditions, pasture slope).

This type of information is expected to help identify sustainable ways of managing pastures, especially those that protect soil health and landscape, and provide evidence to the role of farmers in safeguarding the natural resources of the valley.

Final user of the solution:

- Farmers, farmers associations and private/public land owners monitoring the quality of attended to pastures.
- Experts at the local level who monitor the land evolution over time and who are responsible for defining sustainable practices and policies.
- Content creators that generate descriptions of the pastures used by dairy cows contributing to the production of traditional cheeses of Valle di Sole.

Objectives/Expected Result:

The aim of this challenge is to provide the region with an innovative method for pasture ecosystem monitoring. The expected result is an **experimental technological platform** able to integrate data from multiple sources (for example, sensors, digital devices, aerial images, satellite images....). The platform should be composed of integrated parts,-including:

- Intelligent algorithms (based on Machine Learning or Artificial Intelligence) to classify and analyse phenomena.
- A front-end user-friendly interface to let non-expert users inspect the analysis results, in particular about location and extension of pastures and land curated by farmers, and soil properties. Examples of user-friendly visualization can be (but are not limited to) data dashboards.

Requisites:**Mandatory:**

- Italian and English interface for the front-end application displaying data analysis results.
- Availability for a limited number of travels (1-2 as a minimum) to Valle di Sole as necessary for system deployment, testing, and training, within the timeframe of the Support Programme duration.
- Solution should integrate data from existing databases containing fine-grained information on Valle di Sole land status and usage, that will be provided during the Support Programme.



Challenge #3

Pilot Region: [Tramuntana/Sóller, Spain](#)

Challenge name: **AI Chatbot for personalized touristic experience**

Short description of the problem to be solved:

The economy of the Valley of Sóller is deeply rooted in agriculture and tourism, two sectors characterized by their seasonal nature. Despite their long-standing presence, there exists minimal interaction between these industries, hindering potential synergies. At the same time, cultural and tourism offerings are scattered and not well promoted nor well distributed throughout the territory, resulting in tourism massification around specific hot spots and events.

Final user of the solution:

Front-end users: tourists and local residents;

Back-end users: DMOs (Hotel and Restaurant Association, Municipality...)

Objectives/Expected Result:

The aim of this challenge is to improve the diversification of the tourism offering in the Valley of Sóller and its surrounding, by providing tailored recommendations to end-users of alternative tourism experiences based on rural tourism, local products, and natural, cultural and historical heritage, while collecting and analyzing data to improve tourism management in the region.

The foreseen solution is a chatbot or virtual assistant that answers questions in multiple languages and personalizes the visitor experience. The solution should direct tourists/visitors to less crowded places and less-known tourism experiences.

Expected results:

- Multilingual AI Chatbot that can provide personalized tourism experience recommendations and that support tourists in the planning of their trip, while contributing to decreasing tourism massification in the region.
- An AI solution that supports DMOs in capturing data, extracting and visualizing statistics and information, and in building tourist loyalty.

Requisites:

Mandatory:

- The solution must be viewable on multiple devices (mobile, desktop, or tablet), allowing its use with the most common web browsers.



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- The solution should offer detailed statistics for DMOs to analyze the performance of the chatbot and improve its responsiveness, as well as a dashboard to view conversations, trends, queries and satisfaction level of users.
- The solution should perform web scrapping of the cultural events promoted through the different cultural agendas existing in the region, as well as other data sources related to local rural tourism assets.
- The solution must be able to perform adequate profiling of the user (gender, nationality, age range, taste, etc.) and provide instant answers to the queries made.
- As the solution is targeting tourists and local residents, it must be multilingual and be available at least in English, German, French, Spanish and Catalan. Applicants are free to consider other additional languages.
- The system must be able to collect the opinions and satisfaction levels of tourists in order to generate reports that can be exported monthly.
- Applicants must provide training and provide users manuals to facilitate the easy adoption and use of the solution by DMOs, contributing therefore to increase the digitalization of the destination. Training can be done online, although in-person training would be preferred.
- The proposed solution must comply with the following UNE standards:
 - UNE 178503:2022 Semantics applied to smart tourist destinations.
 - UNE 178502:2022 Framework for the creation of tourist destination websites.
- The solution offered must be available for use 24 hours a day, 365 days a year, guaranteeing 98% availability.

Preferential:

- Applicants who demonstrate previous experience in the development of AI tools and virtual assistants for the tourism sector will be considered preferential.
- Given the commitment to the accessibility of the pilot's destination, applicants with the "UNE-ISO 21902 Accessible Tourism for All" certification will be positively seen
- Statistics and aggregated data resulting from the use of the application should be shared with DMOs and integrated in the tourism data dashboard of the region.



Challenge #4

Pilot Region: Tramuntana/Sóller, Spain

Challenge name: **AI tool for micro-farming management**

Short description of the problem to be solved:

Agriculture is one of the most important (and historic) economic sectors for the valley of Sóller, located in the Tramuntana mountains range of the Balearic Islands. However, despite the significance of its local products, the primary sector in the municipality encounters various challenges: (i) the gradual decline of traditional productive activities among the younger generation, evident in the aging demographic of farm managers, with an average age surpassing 60 years; (ii) the effects of climate change, leading to water scarcity and directly affecting the productivity of local crops; and (iii) the competitiveness of small-scale producers is hampered by their limited access to subsidies and poor knowledge on digitalization for production and sales.

Final user of the solution:

Small-scale producers and farmer cooperatives.

Objectives/Expected Result:

The aim of this challenge is to increase the efficiency, profitability and sustainability of small-scale farms in the Valley of Sóller through the provision of an innovative solution based on the use of affordable devices (smartphones) and adapted to the needs of the rural environment.

The foreseen solution should support small-scale producers in harvest planning and logistics organization, optimizing the quality and value of production, and should enable early diagnosis of pests/diseases and water stress by taking photos of affected plants/fruits. This should be done through the development of a mobile application that uses smartphone cameras and AI models trained locally or in the cloud, allowing small-scale producers to take images directly in the field and obtain an instant diagnosis with tailored recommendations for actions.

Expected results:

- User friendly mobile application for management of small-scale crops and fields, enabling planning and monitoring of different types of crops.
- Immediate notification to farmers upon detection of pests or diseases, facilitating rapid responses and reducing damage.
- Recording and traceability of outbreaks, with aggregate monitoring of plant health within the pilot's territory, enabling the planning of more efficient treatment campaigns.
- Integration of phytosanitary recommendations tailored to the type of crop and the problem detected.



- Visual analysis, using the mobile camera, of visible signs of water stress (color changes, leaf curling) or nutritional deficiencies (chlorosis, spots, etc.), helping in irrigation and fertilization decision-making.
- Automated irrigation and fertilization suggestions, optimizing resources and costs.
- Geolocated visualization of problem areas, allowing action to be taken only where necessary.

Requisites:**Mandatory:**

- Application must run on Android and Apple operating systems.
- User interface must be in Spanish and English. Additional languages (in particular Catalan) would be a plus.
- Applicants must provide short training for technicians and farmers to facilitate the easy adoption and increase of digitalization in rural areas. Training can be done remotely, however in-person demonstration would be a plus.

Preferential:

- Technology should be accessible, and priority should be given to the use of common smartphones, low-cost cameras, and lightweight or cloud-integrated AI models to reduce costs. Offline operating models should also be considered due to the difficulty of field coverage.
- Ideally, the solution should envisage a modular structure to enable the addition of new crops or problems in the future.
- Applicant's experience in Computer Vision and Edge AI for Mobile/Embedded Devices, with developed applications involving computer vision and artificial intelligence for mobile devices or Edge Computing platforms and successful deployments in real-world environments, will be viewed as an added value.
- Applicants who demonstrate previous experience in the development of similar AI tools and mobile applications related to the agricultural sector will be considered preferential.



Challenge #5

Pilot Region: [Northern Ostrobothnia, Finland](#)

Challenge name: **Smart Economy Service Platform**

Short description of the problem to be solved:

In rural Northern Ostrobothnia, many local services—including occasional, on-demand, or small-scale offerings—struggle to reach those who need them. Service providers such as part-time workers, self-employed individuals, or retirees with valuable skills often lack effective digital tools to market their services. Meanwhile, customers—including elderly residents, cottage owners, and other locals—struggle to find reliable help for everyday tasks like snow plowing, home maintenance, or companionship for relatives. Existing tools such as light entrepreneurship invoicing platforms, word-of-mouth through social media, or local classifieds are fragmented, limited in reach, and not always user-friendly for different target groups.

The region aims to develop or pilot a digital service platform that better connects service providers with individuals who need these services. The platform should enable easy, trusted, and locally embedded interaction between users and service providers. This will support local economies and help reduce service gaps in rural areas.

Final user of the solution:

- Service providers such as light entrepreneurs, freelancers, retirees, or SMEs offering services in areas like home maintenance, personal assistance, and seasonal tasks.
- Service users such as elderly people, cottage owners, rural residents, and informal caregivers seeking trusted and accessible services nearby.

Objectives/Expected Result:

The challenge seeks to support local resilience and service accessibility through a pilot of a smart digital economy platform that:

- Matches local service providers and those needing their services in a user-friendly and trust-building way.
- Supports occasional, seasonal, or informal service offerings common in rural areas.
- Provides standardized visibility for enrolled service providers and their offerings so that the end customers can search and browse those offerings.
- Offers an easy way for service providers to enrol onto the platform and create/modify their offerings.
- Enables end customers to rate and post review comments of the service providers.
- Enables end customers to report abusive/suspicious or otherwise questionable service providers to be reviewed by the platform administrators.
- Is adaptable to different user groups, including those less familiar with digital tools.
- Supports trust, transparency, and clear terms between provider and client.
- Enhances local livelihoods and boosts visibility for small-scale providers.



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- Builds a scalable model that could be adapted across various rural regions.
- Operates with a business model and earning logics that have the potential to support profitable or at least sustainable operations in the long run.

Expected results include:

- A functioning and tested service platform pilot in the Nivala, Alavieska and Kalajoki pilot municipalities.
- Demonstrated user value from both service providers and customers.

Requisites:

Preferential:

- Applicants with demonstrated understanding of rural and sparsely populated service contexts in Finland will be considered preferential.

Mandatory:

- Multilingual user interface (Finnish and English at minimum).
- Mobile-first platform design (accessible via smartphones and web browsers).
- Clear onboarding and trust-building features for both clients and providers.
- The applicant is required to present a tentative cost and action plan on how to continue maintaining the platform for at least two years after the end of the Support Programme.
- The platform should include a guide on how to start and run a microservice business on the platform.
- The Solution should include a functionality to support customer feedback and reputation/trust mechanisms.
- The beneficiary should support the awareness campaign and the trainings about the solution, participating in online meetings and at least one physical meeting in the pilot's municipalities.



Challenge #6

Pilot Region: Northern Ostrobothnia, Finland

Challenge name: **AI-Assisted Conceptualization of Rural Businesses Based on Deep Local Knowledge**

Short description of the problem to be solved:

Many rural regions, including Northern Ostrobothnia, have untapped entrepreneurial potential among youth, recent graduates, and unemployed individuals. However, starting or reshaping a business remains difficult—especially for those who lack experience in entrepreneurship, are unsure of local demand, or don't know where to begin. At the same time, general-purpose AI tools lack contextual understanding of rural realities, customer preferences, policy frameworks, and tacit local knowledge. What's missing is an accessible and deeply context-aware tool to support structured, grounded, and realistic business conceptualization in rural environments.

This challenge seeks to address the gap by piloting a locally trained AI-based business conceptualization tool that can help users in Northern Ostrobothnia—regardless of their prior business knowledge—develop new or existing business ideas. The tool will offer guidance, generate required documents, and connect users with relevant local knowledge and support structures. The tool will also be aware of relevant regulations applicable in the region as well as its implications to business concepts that are developed with the tool. The tool will be developed in close collaboration with local communities and other stakeholders. It will be disseminated amongst the communities with substantial sponsorship and support from e.g. public organizations and local government actors in the pilot region of Northern Ostrobothnia.

Final user of the solution:

- Aspiring rural entrepreneurs, particularly youth, recent graduates, and unemployed individuals considering entrepreneurship as a career path.
- Existing rural entrepreneurs developing or pivoting their business.
- Business support actors (e.g. municipal advisors, entrepreneurial support organizations such as Finnish New Business Centers).
- Educational institutions supporting entrepreneurship pathways and providing entrepreneurship education at different grades.

Objectives/Expected Result:

The aim is to provide a customized, AI-based solution that enables aspiring and current entrepreneurs to:

- Build and develop structured business concepts tailored to the local context.
- Receive step-by-step support even with limited prior knowledge.
- Understand local supply, demand, regulation, and customer preferences based on regionally trained data.



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- Generate documents such as business plans and strategy outlines for use with funding providers, investors, and stakeholders.
- Distribution channels activated through education institutions and business support organizations.

The expected results include:

- A tested AI tool (e.g. based on custom GPTs) trained with Northern Ostrobothnia-specific business environment data (key information about local environment, context, culture, demographics, consumer preferences, regulations and existing businesses) publicly available and that will be partially provided during the Support Programme.
- The final solution should have the ability to support entrepreneurs with limited business and digital skills and should be operated within a customized browser-based service for outstanding end user experience and ease of use
- Human-AI co-development logic: guidance even for users unsure where to begin.

Requisites:

Preferential:

- Modular, scalable architecture and/or open-source design will be a plus.
- Solution with embedded functionality for human coaching pathways or escalation to human advisors will be a plus.
- Applicants with demonstrated ability to support new business ideas from low-threshold to funding-ready will be considered preferential.

Mandatory:

- Use of custom AI models (e.g., GPT-based) trained on local data, including business environment, policy, regulation, and customer behavior.
- Ability for the service administrators to extract data of trends, statistics and queries made by end users.
- A tentative cost and action plan to continue maintaining the solution after the end of the Support Programme must be provided.
- The solution should be developed in close collaboration with local stakeholders to ensure contextual relevance and deep local knowledge within the tool that will be facilitated during the Support Programme
- The solution should provide a functionality to generate structured business development documents (e.g., business plans, strategy outlines)
- Multilingual interface (at least Finnish and English required)
- Integrated onboarding through face-to-face (at least 5, meaning that the applicant would need to spend up to 3 days in the pilot region to perform the on-boarding) and remote sessions (at least 10) with local business support organisations and education institutions.

Challenge #7

Pilot Region: East Herzegovina, Bosnia and Herzegovina

Challenge name: **Smart B2B platform for the agro-tourism sector**

Short description of the problem to be solved:

The agro-tourism sector in East Herzegovina lacks a centralized, secure digital environment for internal communication, resource sharing, and collaboration. There is currently no unified platform for accessing laws, funding opportunities, promotional support, or experience exchange among stakeholders. This limits innovation, digital visibility, and the competitiveness of small tourism and rural businesses.

The region needs a B2B platform for the agro-tourism sector with community engagement tools for sharing experiences and creating new business connections.

Final user of the solution:

1. Stakeholders of the agro-tourism sector in East Herzegovina:

- Rural households offering accommodation and rural experiences.
- Local agricultural producers.
- Restaurants and traditional food providers.
- Tour operators and experience creators.
- Small hotels and private accommodations.
- Local tourist organizations and development agencies.

2. Platform administrators

Objectives/Expected Result:

Development of an innovative user friendly digital platform that will enable centralized access to information, legislation, funding opportunities, as well as tools for cross-sector collaboration and exchange of experiences among users from the agro-tourism sector:

- Creation of a centralized digital environment for stakeholders in agro-tourism.
- Improved access to information on tourism-related laws, regulations, and funding.
- Enhanced access to information on financing opportunities, grants, and public calls.
- Enabling the sharing of experiences and best practices among users.
- Encouraging cross-sector collaboration between tourism, accommodation, and agriculture.
- Integration of AI assistant to support users in generating and optimizing social media content and stories, while also providing comparative data.
- Providing users with access to a centralized learning hub through webinars, guidelines, and training.
- Hosting a Q&A forum for quick assistance with everyday challenges.



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- Encouraging collaborative data collection on local attractions, trails, legends, and services.

The beneficiary of this challenge will be expected to work in close collaboration with the beneficiary of Challenge #8, allowing for seamless data flow and cross-platform collaboration. This will be organized through the Support Programme.

Requisites:**Mandatory:**

- The platform must ensure a secure user login system with role-based access control.
- Multilingual interface (Bosnian-Croatian-Serbian and English). Local language support.
- A helpdesk/support mechanism should be provided during the initial rollout phase to assist users in content upload, system navigation, and platform functionalities.
- The platform should be user friendly.
- The platform should include a content management system with an approval workflow.
- The platform should include an AI assistant for content creation.
- The platform should include backend architecture for storing and categorizing relevant data.
- The platform should include moderation tools for administrators.

Preferential:

- The platform will ideally have support for integration of translation tools.
- The preferred solution will have a mobile-friendly design.
- Compatibility with existing databases via CSV or Excel file import.
- Support for embedded multimedia content (YouTube, 360° images, etc.).
- Analytics on user engagement, collected resources, and sectoral trends.

Challenge #8

Pilot Region: Trebinje/East Herzegovina, Bosnia and Herzegovina

Challenge name: **SMART platform for personalized tourism experience**

Short description of the problem to be solved:

East Herzegovina is a geographical area, encompassing the city of Trebinje and municipalities Berkovici, Bileca, Gacko, Istocni Mostar, Kalinovik, Ljubinje and Nevesinje, that has been severely affected by population displacement. Almost entire villages are closing down as young people leave in search of better jobs. At the same time, East Herzegovina is a region that has a very rich cultural and historical heritage, beautiful nature, unique gastronomy and local knowledge that could be used for the development of rural tourism, which would generate additional income for the local population, thereby slowing down the trend of displacement. Some municipalities in East Herzegovina have their own tourist websites with scarce and outdated information that does not meet the needs of tourists for independent exploration of the region. Also, these municipalities, with the exception of the city of Trebinje, are so small that it makes no sense to present themselves as individual destinations. The region lacks a smart interactive tourist platform localized on East Herzegovina offering personalized tourism experience of the whole region.

Final user of the solution:

1. Tourists and stakeholders of the agro-tourism sector in East Herzegovina:

- Domestic and international tourists.
- Local accommodation providers, restaurants, guides.
- Small agricultural households and food producers.
- Local tourism organizations, DMOs, and development agencies.
- Public institutions and researchers interested in tourism and rural innovation.

2. Platform administrators

Objectives/Expected Result:

The goal of this challenge is to improve the visibility of the tourism potential of rural East Herzegovina, which will help end users/tourists in planning their trip and speed up and create their desired itineraries which will result in increased consumption of tourist content and services in rural destinations. Although this platform is not a traditional B2C marketplace, it will serve as a publicly accessible digital portal that offers end-users a personalized way to explore curated tourism experiences in East Herzegovina.

Solution should be a smart interactive tourist platform localized on East Herzegovina offering personalized tourism experience. Special emphasis is placed on the integration of an advanced AI-based system for dynamic content personalization. The platform will offer a dedicated back-end interface for verified tourism stakeholders — such as municipalities, local tourism organizations,



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accommodation providers, guides, and agricultural producers — enabling them to upload and manage their tourism services and content (photos, videos, events, promotions); Regularly update offers to reflect real-time availability and seasonality; Interact with tourists through moderated reviews and recommendations; Contribute content that feeds into the AI recommendation engine and overall platform visibility (subject to administrator approval).

The platform ideally should:

1. Contain an interactive map (geo-located points of interest, accommodation, trails, roads, services...) and collect tourism assets across East Herzegovina (that will be provided to the beneficiaries during the Support Programme):
 - a. agrotourism households (location on Google maps, their personal stories, experiences they offer, selling products, short videos...)
 - b. cultural and historical heritage of the region (monuments, bridges, monasteries, churches...)
 - c. natural heritage (rivers, lakes, springs, caves, typical wild plants...)
 - d. local gastronomy (products, recipes...)
 - e. local immaterial heritage (local know-how, local folklore, old handicrafts, legends, myths, ...)
 - f. festivals and events in region
2. Allow tourists to share their stories, videos, photos, experiences - Blog posts (e.g. promotion of tourism potential, video presentations of households, etc), in accordance with content moderation and control mechanisms.
3. Suggest highlights based on tourist characteristics (e.g. families etc.).
4. Include a presentation system for accommodations (lodging, restaurants, etc.).
5. Showcase events and tour booking features.
6. Include gamification, surveys, and questionnaires.
7. Integrate AI support for tourists and tourism professionals.

The beneficiary of this Challenge will be expected to work in close collaboration with the beneficiary of Challenge #7, allowing for seamless data flow and cross-platform collaboration. This will be organized through the Support Programme.

Requisites:

Mandatory:

- The web platform must be fully compatible with all major operating systems, including Android, iOS, Windows, and macOS. The web platform should integrate services and communication, including both a portal and backend access (CMS functionality).
- The platform should be bilingual, BCS (Bosnian-Croatian-Serbian) and English. If the applicant can offer a platform in Italian too, it would be desirable, but not mandatory.
- The interface must be designed to guide the user through an intuitive selection process, using modern patterns such as microinteractions, progressive forms, and real-time content updates.



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- The applicant must provide a detailed description of the content moderation strategy (Role-based moderation system that allows only approved users (e.g. verified tourism stakeholders) to submit content; Clear content policy, Moderation workflow etc.)
- The solution must implement an AI-based system that uses a conversational interface and multi-step questionnaire to gather user preferences. Special emphasis is placed on the integration of an advanced AI-based system for dynamic content personalization.
- The system must apply semantic recognition, classification, and vectorization techniques to match user input with the internal tourism offer database and generate personalized travel suggestions in the form of a dynamic report.
- The applicant is required to present a tentative cost plan to maintain the platform for two years after the end of the Support Programme (time covered by the Subgrant Agreement).
- Applicants must provide short on line training and users manual for final users (tourist organisations and ministries) about the way of using platform and entering new and changing content.
- Integration with external data sources (e.g., weather, crowd levels, local events, seasonality).
- The system must be able to collect the opinions and satisfaction levels of tourists.
- The solution offered must be available for use 24 hours a day, 365 days a year, guaranteeing 98% availability.

Preferential:

- Design brand and visual identity (logo, slogan, visual concept...) would be desirable.



Challenge #9

Pilot Region: Šmarje-Padna, Slovenia, Italy, Croatia

Challenge name: **Mobile App for mobility on demand**

Short description of the problem to be solved:

The Šmarje–Padna pilot region, located in the rural hinterland of Slovenia’s coastal area, faces significant mobility challenges that affect daily life for residents and limit local development. Public transportation is infrequent, poorly aligned with real needs, and unavailable on weekends and evenings—creating serious obstacles for elderly residents needing access to healthcare and essential services, school children requiring transport outside of school hours and tourists seeking to visit the area. This lack of accessible, flexible mobility contributes to social isolation, increases reliance on private vehicles, and hinders sustainable tourism and local economic growth.

The countryside, in comparison to the coastal areas, remains disadvantaged—particularly when it comes to public transport.

The proposed solution will address the inadequacy of the current public transport system, which neither meets the needs of the pilot communities nor supports the evolving demands of tourism development. A special focus will be given to smaller settlements with limited access to public transport and low frequency of service connections, i.e. Šmarje, Padna, Nova vas and other smaller communities.

Final user of the solution:

Front-end users: tourists and local residents;

Back-end users: public-private partnership between the successful tenderer and the identified public body.

Objectives/Expected Result:

The objective of the solution will result in accessible and sustainable mobility service, tailored to the specific needs of various target groups and their demographic characteristics. By introducing a targeted and innovative solution focused on improving connectivity, accessibility, and the overall attractiveness of the area through a holistic and inclusive approach, the following key issues in pilot will be effectively addressed:

- (i) the absence of sustainable mobility options for older adults, parents with young children, teenagers, and tourists;
- (ii) the lack of a complementary circular economy service to support the broader sustainable innovation ecosystem; and
- (iii) the insufficient awareness and education on environmental issues.

Expected results:

- User friendly mobile application designed in line with the collected data from the field, reflecting the real needs of the target groups (ideally TRL 8).
- A digital system for tracking and rewarding sustainable travel routes.



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- Building connections with local providers in the circular economy (olive and wine makers, local festivals, cultural and tourist institutions, development agencies).
- Building connections with local, national and international policy bodies (municipalities, national bodies, technical partners, local community and NGOs).
- Connecting volunteers and users, e.g. the elderly and children's parents.
- The emphasis is not solely on transportation but also on accompanying the elderly, preventing loneliness, and promoting intergenerational connections.
- Supporting social responsibility, innovation, and inclusive mobility.
- Data-driven policy making through anonymized mobility data insights.
- Modular and open-source solution that can be replicated in other rural regions.

Requisites:

Mandatory:

- Technology should be accessible, and priority should be given to the use of common smartphones.
- Native mobile application (cross-platform) and web-based admin dashboard.
- Solution should include:
 - Route tracking (automatic via GPS or manual input).
 - Display of calculated carbon savings.
 - Reward system (eco-points) for sustainable travel.
 - Catalogue of local rewards (e.g. random free entry to a local museum, discounts with wine makers, olive makers, local events).
 - Local challenges (e.g. "Walk to the market 5 times in one month").
 - Gamified reward system – Users earn eco-points for sustainable travel, which can be exchanged for local rewards.
 - Push notifications – Configurable alerts for updates, reminders, and important user messages.
 - Geolocation and map display – Display nearby transport options, local services, including drinking water fountain (Padna) and user routes on an interactive map.
 - Carbon savings calculator – Calculates and displays estimated CO₂ savings based on user mobility to promote environmental awareness/education.
- The application must run on Android and Apple iOS operating systems.
- User interface must be in Slovenian, Italian, Croatian and English.
- Applicants should provide the estimated cost of the maintenance for the developed solution after the Support Programme.
- The Beneficiary of this Challenge must provide a short (in person) training for end users, as well as for representatives of local and municipality bodies to facilitate the easy adoption and increase of digitalization in rural areas (One trip to the Pilot Region will be necessary).
- The Beneficiary of this Challenge must create simple tutorials for target groups to stipulate the use of the service and facilitate user's trust in the use of the service.
- The Beneficiary is expected to identify and source relevant public datasets independently (e.g. through open data portals or municipal sources). However, the project partners – specifically the University of Ljubljana and Rotunda – will offer soft support within the scope of their project tasks and will also provide access to the data they own, where relevant and feasible.



Preferential:

- The solution should envisage a modular structure to enable the addition for circular economy solutions and allow replication in other rural areas.
- Low-bandwidth optimization – Ensure smooth app performance in areas with limited or unstable internet connectivity.
- Support for cycling infrastructure – Include bike lanes, repair stations, and local cycling challenges within the app.



Challenge #10

Pilot Region: Devetaki Plateau, Bulgaria

Challenge name: **AI GP Support System**

Short description of the problem to be solved:

In the Devetaki Plateau, a sparsely populated rural region in Bulgaria, residents face persistent challenges in accessing consistent and timely primary healthcare. General Practitioners (GPs), who serve multiple remote villages, currently lack digital tools to help them prioritize visits based on real-time medical need or to prepare for consultations using up-to-date patient information. The absence of a centralized system to manage and monitor patient symptoms, plan routes, and schedule visits results in inefficient care delivery and potentially delayed interventions for critical cases.

This challenge seeks the development of a secure, software-based solution to support GPs working in rural areas by enabling digital symptom tracking, triage classification, and smart visit planning. The proposed solution must ensure full compliance with EU data protection regulations (e.g., GDPR) and integrate ethical safeguards around the handling of sensitive health information. The system should be designed with a user-friendly interface and account for limited digital literacy among both patients and healthcare staff. Emphasis should be placed on creating a privacy-respecting digital workflow that enhances, rather than replaces, the role of medical professionals in community-based care.

The pilot area of the Devetaki Plateau is already equipped with internet connectivity through local community centers across the nine target villages.

The focus is exclusively on the development of a digital solution that can operate efficiently within the constraints of the existing infrastructure.

Final user of the solution:

- General Practitioners (GPs) operating in rural areas.
- Municipal/local health authorities organizing visit logistics.
- Potential future integration: patients (read-only interface or kiosk-based).

Objectives/Expected Result:

- Provide an AI-supported triage and patient monitoring system that informs GPs of patients' symptoms.
- Support better planning of field visits of GPs based on severity and urgency (red/yellow/green classification).
- Support continuity of care through structured symptom tracking over time.
- Enable better coordination across municipalities in managing rural healthcare delivery.
- Reduce visit duration by offering doctors pre-filled symptom information.



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- Facilitate early identification of potentially urgent health cases.
- The solution is expected to support, not replace, medical professionals. AI-generated outputs must not provide autonomous diagnoses or treatments. Medical responsibility will remain fully with licensed practitioners.
- The solution should align with the broader action plan for improving rural healthcare accessibility and must be designed for future scalability across all villages in the participating municipalities. A formal agreement between Sevlievo, Lovech, and Letnitsa enables cross-municipal coordination, and the digital solution should support interoperability within this framework to allow expansion beyond the initial pilot villages.

Requisites:

Mandatory:

- The required solution should include:
 - A web-based and tablet-compatible interface for data entry and symptom tracking by community staff or healthcare workers.
 - A centralized, GDPR-compliant architecture for storing and processing sensitive health data, either cloud-based or deployable on an existing secure server infrastructure maintained by Sevlievo Municipality.
 - A role-based access system that ensures only authorized healthcare professionals and administrative staff can access patient data, aligned with ethical and legal standards.
 - The ability to interoperate across municipal boundaries, as a formal agreement exists between the three municipalities involved in the pilot (Sevlievo, Lovech, Letnitsa) to coordinate system deployment and sustainability through Sevlievo as the lead data administrator.
 - The proposed digital solution should be designed with low-bandwidth environments and offline sync capabilities in mind, to ensure accessibility in remote villages where connectivity may be inconsistent.
 - Online and mobile-accessible dashboard for GPs.
 - Patient data intake via simple interface (filled by nurse, volunteer, or during prior visit).
 - The system will include an AI-driven classification engine based on symptom input. It will serve exclusively as a **clinical decision-support tool**, providing suggestions and confidence scores to assist health professionals.
 - Historical patient record viewing.
 - Bulgarian language interface and English. Multilingual support optional (AI translator).
 - Secure data storage and transmission.
 - User access levels (doctor/admin-only access).
- Applicants will be expected to deliver a short online or in-person training session for local healthcare staff and municipal representatives on the use of the prototype.
- Applicants must create simple tutorials for target groups to stipulate the use of the service and facilitate user's trust in the use of the service.
- Applicants must plan for at least two in-person visits to the Pilot region (Sevlievo, Bulgaria) during the co-creation and testing phases.



- Applicants should estimate the potential cost for future maintenance after the end of the project, ensuring sustainability of the digital solution beyond the project duration with possible self funding from the municipality or other funding lines.

Preferential:

- Solution preferred features:
 - Offline functionality or data caching.
 - Integration with email/SMS alert system for red-flag cases.
 - Modular structure for future expansion.
 - Intuitive UX for non-tech-savvy doctors.
 - Backend architecture for storing and categorizing relevant data.
- Applicants with Expertise in AI systems, AI classification and data science and PhD level are preferred.

Reference Info:

- Information derived from SMART ERA WP5 pilot activities in Devetaki Plateau, based on multiple SIP workshops (Lovech, Sevlievo, Letnitsa) will be provided.
- A data centre in the Municipality of Sevelivo will be used for safeguarding data and as a central database for the project during the Support Programme.
- Technological hardware units (in each of the 9 villages) will be used for testing during the Support Programme.



Challenge #11

Pilot Region: Devetaki Plateau, Bulgaria

Challenge name: **Map-based digital platform for rural tourism information, promotion and tailor made trips**

Short description of the problem to be solved:

The Devetaki Plateau is a rural area in Central North Bulgaria, encompassing nine villages: Agatovo, Brestovo, Gorsko Slivovo, Devetaki, Kramolin, Krushuna, Kakrina, Karpachevo, and Tepava. They are in the administrative borders of three different municipalities - Letnitsa, Lovech and Sevlievo, different in size, structure, and economic development. The nine villages, however, have a very similar profile - negative demographic trend due to lack of jobs and poor access to services. In the last fifteen years, though, the region has started to develop as a tourist destination, stepping on its valuable natural and cultural heritage and the initiative of local families and small businesses, fostered by the Devetaki Plateau Association. To this end, the Association, the 3 municipalities and the local community have invested efforts in collecting data, information and visual materials from the region. In order to promote the region as a smart, attractive destination across Europe, a modern AI tool is necessary to collect all the data and information, pictures, films, and other materials in one place, and to help potential tourists plan their stay in the area.

Final users of the solution:

- local tourist businesses (accommodation, restaurants, shops), local authorities, the local community,
- and tourists / visitors to the area.

Objectives/Expected Result:

The Devetaki Plateau Digital Tourism Platform shall be a comprehensive, map-based hub designed to showcase the natural beauty, cultural heritage, and vibrant community life of the Devetaki Plateau. This all-in-one digital solution will bring together everything a visitor might need — from travel inspiration to on-the-ground navigation — in a single, user-friendly platform. It will also serve the local stakeholders - to promote their services, products, and experiences.

The Solution should have two different types of interfaces and different right access.

The initiative aims to:

- Boost sustainable tourism across the region.
- Highlight the Plateau's rich cultural and natural diversity.
- Strengthen the local economy by enabling businesses and tourism operators to promote their products on a broad scale - Europe-wide and worldwide.
- Bridge gaps in expertise by guiding visitors through curated itineraries and helpful resources.



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- Most importantly, it gives local stakeholders the tools they need to present the Plateau to the world — in their own voice.

Requisites:

Mandatory:

- **Interactive Map Interface:** the platform should display the entire Devetaki Plateau through a dynamic, GPS-enabled map that connects travelers with hidden gems, must-see landmarks, cultural and other events, and unique local experiences. Clearly defined regional boundaries on the map focus content creation and sharing within the area of the Devetaki Plateau.
- **The Platform should integrate a module enabling the moderation of the Community-Driven Content:** Local businesses, guides, municipalities, and residents have full control over content creation and moderation, ensuring the platform reflects the authentic voice and spirit of the region.
- **Moderation and Control Tools:**
 - Moderators should be able to delete or flag comments, and remove users who violate terms of service.
 - The users should be able to flag inappropriate content (offensive, abusive, fake, etc.).
 - Flagged content will appear blurred and marked for review until resolved by a moderator.
- **Engagement and Social Features:** Tourists should be able to leave reviews, comments, and photos, connect with others, and even send private messages — fostering a community of engaged, informed travelers.
- **AI-Powered Smart Itineraries:** Visitors should be able to personalize their journey with AI-driven suggestions tailored to their interests, from nature and history to food and adventure — no travel agent needed.
- **Easy Sharing Across Platforms:** With seamless integration into popular social networks like Facebook and Instagram, locals can amplify their reach and attract new visitors with just a click.
- **Secure Sign-On:** Users should be able to sign in with Google and other trusted providers—no passwords stored by the app.
- **The solution shall be in Bulgarian, English and multilingual through AI-based translator and viewable on multiple devices (mobile, desktop, or tablet).**
- **Provision of training for the Devetaki Plateau Association, the local business community, as well as local administrations to develop skills and foster participation and use of the platform (it could be done on-line or in person).**
- **The applicant is required to present a tentative cost plan to maintain the platform for two years after the end of the Support Programme.**

Preferential:

- Applicants with demonstrated skills in the development of platforms / applications will be considered preferential.



Annex 2

SMART ERA

Integration & Interoperability Methodology



About this Annex

This annex provides the SMARTERA Integration & Interoperability Methodology. Its purpose is to present a **concise overview** of the practical implementation of the methodology.

The focus here is on the **operational dimension**: how the methodology is applied in practice across the project's pilot sites.

This version is intended to serve as a practical reference for stakeholders directly involved in the deployment of SMART ERA's technological components, such as **technical partners, pilot coordinators, and Open Call applicants**, who require a clear understanding of the step-by-step activities and processes related to implementation.

Methodology Implementation

This section concludes the methodological definition by outlining the structured approach to be followed for enabling interoperability of SMART ERA pilots data and supporting their integration into technical solutions. More specifically, the core idea behind this approach is that, by following shared interoperability guidelines, heterogeneous datasets from diverse rural contexts can be harmonized, standardized, and made accessible. This enables the development of Software Innovation Packages (SIPs): customized digital solutions designed to address the specific needs of rural pilots, ultimately fostering sustainability, economic growth, improved service efficiency, and other benefits within rural communities.

To achieve these goals, the methodology follows a **structured sequence** of phases with defined directional flows between them:

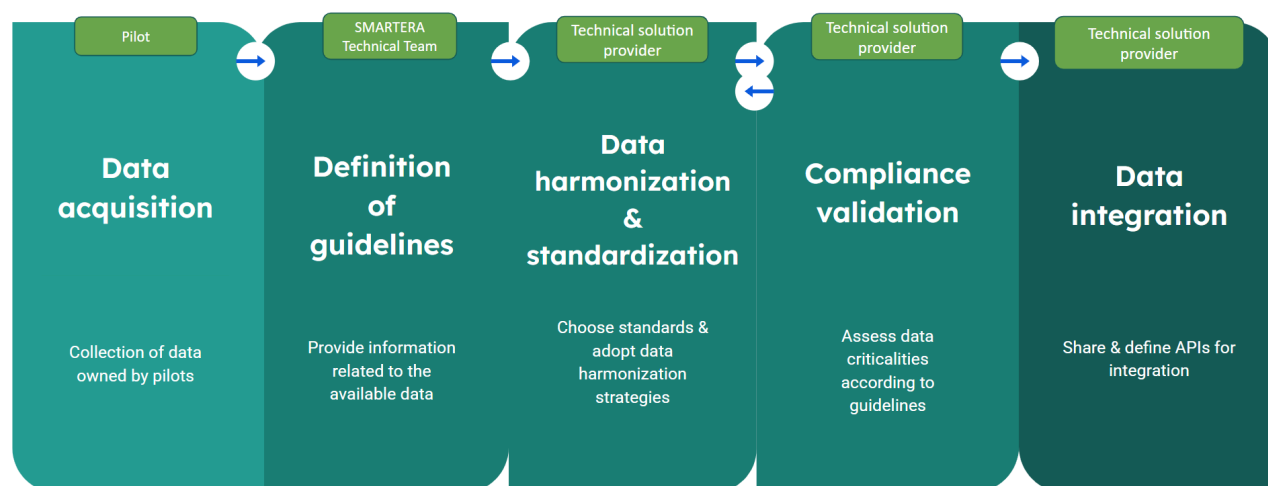
1. **Data Acquisition:** The **Pilot** provides datasets classified by domain, organization type, license, format, and access method, ensuring a structured data collection process. The output of this phase is raw data, which moves forward for standardization. The initial data collected in this phase have already been analysed and discussed in the deliverable D5.1 Pilot needs and gap analysis where the domains of major interest have been individuated for the pilots.
2. **Definition of Guidelines:** The **SMART ERA Technical Team** establishes metadata schemas, standard formats, and governance policies to ensure interoperability. These guidelines are then communicated to the **Technological solution provider**, which must implement them during the harmonization phase. The arrow flows forward as the process advances, but feedback loops may be needed if additional clarifications are required.
3. **Data Harmonization & Standardization:** The **Technological solution provider** processes and transforms data according to interoperability guidelines. This involves schema mapping, data cleaning, and quality assurance. The data then moves forward for compliance validation.
4. **Compliance Validation:** The **Technological solution provider** verifies schema conformity, security compliance, and cross-pilot consistency to ensure data integrity. At this stage, there is a **bidirectional arrow** leading back to **Data Harmonization & Standardization**. This backward flow is crucial because, if issues such as incorrect formatting, missing metadata, or structural inconsistencies are identified, the data must be



reprocessed to meet the required standards. **This iterative validation ensures high data quality before integration.**

5. **Data Integration:** Once compliance is validated, the data is made accessible through APIs by the **Technological solution provider**, enabling dashboards and supporting the development of **Software Innovation Packages**. At this stage, there is no backward movement, as only validated and harmonized data enters the integration phase.

The following Figure represents what have just been described:



In order to technically sustain these phases, a list of tools is recommended in [Appendix A: Supporting Tools and Technologies](#).

1.1. Data Acquisition

In this phase, pilots provide their data, which is systematically categorized to facilitate integration into the SMART ERA ecosystem. According to what was identified in the Pilot needs and gap analysis, the data is first classified according to its domain type, ensuring that it aligns with one of the six key sectors: tourism, agriculture, mobility, healthcare, commerce, or environmental & cultural protection. This classification allows for a structured approach to managing diverse data sources and ensures relevance to rural development objectives. Beyond domain classification, datasets are also categorized based on the type of organization providing the data, distinguishing between government institutions, private companies, research entities, and citizen-driven initiatives. Each dataset is further assessed in terms of its license type, which determines whether the data is open, restricted, or subject to specific access conditions.

To ensure seamless integration, the data format is specified, covering common standards such as CSV, JSON, XML, and specialized geospatial formats like GeoJSON. Finally, the method of data access is defined, whether through APIs, batch file downloads, or real-time data streams. This structured categorization enables a scalable and interoperable approach to data sharing. Then, once data are gathered from the different data sources, in order to let the Technical solution providers to proceed with the harmonization and implementation so that the technical solution can be developed, the two entities (the pilot and the technical solution provider) need to formalize a Data Usage Agreement, as described in Data Access and Usage Control section in the full document.

1.2. Definition of guidelines

Formulation of comprehensive guidelines is the critical foundation for successful implementation of the SMART ERA program. This paragraph provides an overview of how the SMART ERA Technical Team develops and releases guidelines required for system-wide interoperability, data consistency, and governance coherence. These guidelines constitute the architectural framework that the Technological Solution Provider has to adhere to during the process of harmonization, enabling standardization while leaving space for domain-specific requirements.

Metadata Schema Development:

The SMART ERA Technical Team considers metadata schema creation as a fundamental element that underpins the general information architecture. At its most basic level, it is an activity of creating ontological frameworks that laboriously define how entities relate to one another within the broader ecosystem. Hierarchical classification systems are created by the team that traverse both domain-specific taxonomies and cross-domain relationship mappings, conforming to current international standards wherever possible. This ontological model provides a shared semantic meaning to all the participating systems and stakeholders.

Standard Format Specifications:

Standardization of formats is a complementary aspect of metadata schema effort and extends across a number of fronts of the SMART ERA universe. The Technical Team spends a lot of time specifying the correct data exchange formats that fit today's expectations while still being able to support legacy. They tend to prefer JSON and JSON-LD formats for today's API interactions due to their extreme flexibility and their use far and wide. XML formats are accommodated for compatibility with legacy systems so that organizations that have existing infrastructure can participate without wholesale replacement of current systems. For use cases of semantic web, the group establishes standards about RDF and Turtle serializations, but more simple tabular exchange cases could utilize CSV or TSV standards with explicit field definitions.

1.3. Data harmonization & standardization

Data standardization and harmonization are a key step in the SMART ERA implementation model, wherein abstract guidelines confront real-world data realities. This paragraph discusses the end-to-end process by which the Technical Solution Provider converts disparate data sources into an integrated, standardized information environment. Harmonization is more than a technical translation: it is the philosophical and methodological link between heterogeneous data environments and the vision of unified interoperable information systems which directly determines subsequent utility, reliability, and interoperability of all downstream applications of the data.

Schema Mapping Techniques:

Schema mapping is the intellectual heart of data harmonization and requires both technical precision, domain expertise and pilot engagement. The Technological solution provider applies different mapping strategies depending on the complexity of the source-to-target relationship and the semantic richness of the data domains involved.

Direct field mapping provides the simplest transformation approach, where source data elements map to target schema elements with minimal transformation. The team documents such simple mappings in large crosswalk tables that establish an explicit field-to-field correspondence.

Conceptually simple, even direct mapping requires consideration of data type compatibility, field length constraints, and character encoding differences between the systems.

Complex mappings address the cases when the straightforward mapping does not suffice: there may be mathematical calculations, unit transformations, terminology translations, or structure reorganizations.

Data Cleaning Processes:

Data cleaning is an integral part of the harmonization process, addressing quality issues that could otherwise undermine the utility of the standardized dataset. Systematic cleaning procedures are implemented by the Technical Solution Provider at different levels of granularity and address different types of data quality issues. Structural cleaning should apply standardization rules early in the pipeline, using automated pattern recognition to detect and unify inconsistent formats such as those encountered when handling dates, addresses, phone numbers, and delimiters. Capitalization and special character usage should follow predefined conventions aligned with international standards to reduce ambiguity and processing errors.

Value normalization should prioritize the use of controlled vocabularies and reference dictionaries, ideally developed with input from domain experts. Synonyms, abbreviations, and unit conversions must be mapped systematically to common representations, ensuring that semantically equivalent values are harmonized across datasets.

Moreover, handling missing data should not rely on a single approach but instead differentiate among types of absence. The data model should explicitly distinguish between missing values due to errors, intentionally uncollected data, and non-applicable fields. Each case should have a specific code or marker in the standardized schema, preserving the underlying meaning and supporting accurate downstream interpretation.

Quality Assurance Framework:

Quality assurance extends beyond the first data cleaning to build a continuous structure for data monitoring and quality assurance along the harmonization pipeline. The Technological solution provider implements an effective quality assurance architecture with various verification layers and feedback mechanisms.

Automated validation processes represent the first layer of quality assurance, performing syntax checking, constraint checking, relation checking, and pattern matching against predefined data characteristics. These are done on pre-transformation data as well as post-transformation data, with each having an applicable rule set for that phase. The generic validation rules appropriate for all data types and specific domain rules applying to each area define special quality specifications for a given type of information.

Pilots and Technical Solution Providers collaboration during harmonization:

Successful harmonization requires ongoing cooperation between the technical solution provider and the pilots since this is a delicate phase. Such collaboration allows to increase the efficacy of this data transformation process and to overcome the obstacles that may be encountered when it comes to handling data in different languages that may lead to a loss of information or even errors.

Domain expert advice is of greatest value at the early stages of mapping design, where domain experts help uncover semantic nuances that may be lost through technical exploration alone. The



technical solution provider can conduct shared mapping workshops where technical staff and domain experts review example data transformations jointly, separating prospective issues before full implementation. During these workshops, such unstated assumptions and context familiarity are typically revealed as need to be made explicit in the transformation rules.

Recurring feedback loops provide opportunities for continuous refinement during the harmonization process. The technical solution provider uses systematic processes for domain stakeholders to review transformation outputs and provide structured feedback on accuracy and usefulness. This feedback is documented with careful attention and prioritized, with clearly defined criteria for determining which recommendations should be taken forward straight away and which should be subject to further consultation before being implemented.

1.4. Compliance validation

Compliance verification is the systematic activity of determining whether data management practices are aligned with established regulatory requirements and industry standards (adherence to standard data models). It confirms whether data handling, processing, and storage comply with legal stipulations and organizational policies. This activity also assesses the compatibility with the technical components input data format in order to proceed with the subsequent integration phase.

Technical Aspects:

Rule-Based Verification: This involves creating and implementing rules that automatically check data against compliance requirements. Rules can be created on data formats, data values, access rights, and audit trails.

Audit Trail Analysis:

Compliance Validation: This involves auditing trail review for data access, modification, and deletion monitoring. This renders the data handling transparent and accountable.

Data Integrity Checks: It includes verifying data accuracy and completeness so that it meets the compliance requirements. It includes techniques like data validation rules, checksums, and data integrity constraints.

Access Control Verification: Compliance testing includes validation of access to confidential data being restricted to authorized users. This involves verification of access logs, user privileges, and authentication procedures.

Reporting and Documentation: Compliance testing generates reports and documentation evidencing adherence to regulatory requirements and organizational policies. This evidence is required for compliance audits and reviews.

Automated and manual testing: Compliance validation uses both automated systems and manual tests. Automated tests allow for continuous and repetitive checks of large volumes of data. Manual tests, on the other hand, are used to verify specific cases or to assess the actual functionality of the systems from the end user's perspective.

Key Considerations:

Regulatory Compliance: Compliance validation must address relevant legal and regulatory requirements, such as, GDPR, HIPAA, and industry-specific legislation.

Risk Management: Validation of compliance helps to identify and mitigate risks associated with non-compliance, such as legal penalties, loss of reputation, and data breaches.

To summarise, the Technical solution providers should also verify the compliance of the harmonized and standardised data with standard data models. To this goal, for instance, they can exploit tools such as the Data Models Contribution API Full Test⁷, developed by the Smart Data Models program⁸, that allows to validate a certain submission of a data model and it provides feedback in case it is not compliant with the guidelines and the contribution manual and also whether the properties are already used in other data models.

1.5. Data Integration

In SMART ERA, data integration is a foundational element and represents the last step of the methodology. This phase is designed to ensure that diverse datasets from multiple pilots can be effectively harmonized, shared, and reused for the tailored technical components. The strategy is structured around four main pillars: API-based integration, a modular and federated architecture, continuity with previous phases, and adherence to data exchange standards.

By leveraging APIs, the integration phase enables dynamic and seamless access to harmonized data, which is modeled using widely accepted Smart Data Models. This ensures interoperability and supports scalable connections between different systems and services.

The modular and federated nature of the architecture enhances the adaptability of the platform to the specific requirements and governance structures of individual pilots. Rather than enforcing a centralized model, this decentralized approach allows pilots to maintain local control over their data while still contributing to a shared infrastructure. This is crucial in rural contexts and in the specific case of SMART ERA, where technological and organizational diversity across regions must be accommodated without compromising interoperability.

Continuity with previous phases is another key element: by standardizing data through Smart Data Models early in the process, this methodology is based on the fact that APIs and data access protocols are defined once and then reused across pilots. This promotes efficiency, consistency, and reduces the engineering effort required for integration when it comes to integrating data which belong to different pilots with the components owned by the partners.

As already discussed, standards-based data exchange is essential to guarantee long-term sustainability and compatibility with broader European data initiatives. The use of NGSI and NGSI-LD standards allows real-time exchange of contextual data while maintaining semantic consistency. These standards are especially relevant in the context of EU data spaces and smart environments, as they provide a solid foundation for interoperability and future integration with other domains.

A wide number of tools can be employed to implement this integration framework, for instance, FIWARE components, such as the Orion Context Broker and the Scorpio Broker, are widely used for compliant, real-time management of contextual information. They provide reliable mechanisms for data publishing, subscription, and querying using NGSI interfaces. In addition, Idra is another tool that could play a central role in the data dissemination process. Once data is harmonized, Idra enables its publication using the DCAT-AP metadata standard, ensuring uniform and discoverable datasets across platforms. More importantly, Idra supports a federation of datasets from heterogeneous ODMs such as CKAN, DKAN, Socrata, and Orion Context Broker, making them

⁷ <https://smartdatamodels.org/index.php/data-models-contribution-api/>

⁸ <https://smartdatamodels.org/>

available through a single access point. This capability significantly reduces fragmentation, simplifies access for the Technical Solution Providers and their components, and encourages data reuse in line with EU open data regulations.

Appendix A: Supporting Tools and Technologies.

Tool Name / Standard	Description	Application Phase	Strength	License / Cost
Talend Open Studio	Open-source ETL platform for data integration, transformation, and synchronization.	Data Harmonization & Standardization	Wide range of connectors, intuitive graphical interface, active community.	Open-Source (Freemium)
AWS Glue	Fully managed ETL service from Amazon Web Services that simplifies data preparation for analysis.	Data Harmonization & Standardization	Serverless (no infrastructure to manage), integrates natively with the AWS ecosystem.	Pay-per-use
XML / XSD	Standard for representing and exchanging structured data (XML) and for defining their schemas (XSD).	Definition of Guidelines, Data Integration	Universal standard, human-readable, highly extensible.	Open Standard
Protégé	Free and open-source editor for building ontologies and knowledge bases.	Definition of Guidelines	De-facto tool for ontology engineering, supports W3C standards (OWL, RDF).	Open-Source
Apache Camel	Open-source integration framework based on well-known Enterprise Integration Patterns (EIP).	Data Harmonization & Standardization, Data Integration	Highly configurable, lightweight, integrates seamlessly with Java and other frameworks.	Open-Source
Altova MapForce	Graphical tool for mapping, converting, and integrating data between different formats.	Data Harmonization & Standardization	Powerful visual mapping engine, supports XML, JSON, databases, EDI, and more.	Commercial
CKAN	An open-source platform for managing and publishing open data. It provides structured environments to catalogue datasets using metadata standards like	Definition of Guidelines, Data Harmonization & Standardization, Data	Structured environment for cataloguing datasets, supports metadata standards (e.g., DCAT), enables automated data validation and transformation	Open-Source



	DCAT, ensuring discoverability and accessibility.	Integration	processes. It acts as a centralized metadata repository.	
Apache Nifi	An ETL (Extract, Transform, Load) framework.	Data Harmonization & Standardization	Allows organizations to process and harmonize data from multiple sources, applying transformations to ensure consistency with selected standards.	Open-Source (Inferred)
Pandas	A data wrangling tool.	Data Harmonization & Standardization	Helps to clean and structure data while aligning it with predefined schemas.	Open-Source (Inferred)
nRefine	An open-source data wrangling application supporting schema crosswalking through GREL expressions and reconciliation services.	Data Harmonization & Standardization	Helps clean and structure data. Provides functionality for field normalization, character encoding transformation, and batch processing for large-scale direct field mappings.	Open-Source
Swagger OpenAPI /	Tools for the formal definition of API interfaces using machine-readable contracts (typically YAML or JSON). OpenAPI is a specification for formal API description.	Definition of Guidelines, Data Integration	Enables formal definition of API interfaces, ensures consistent documentation, facilitates collaborative development, supports interactive testing environments, and can auto-generate client SDKs, server stubs, and interactive documentation.	Open Standard / Tool (Swagger has open-source components, OpenAPI is a specification)
Postman	A tool for the formal definition of API interfaces.	Definition of Guidelines, Data Integration	Enables formal definition of API interfaces, ensures consistent documentation, facilitates collaborative development, and supports interactive testing environments.	Freemium (Inferred)
Kong	An API gateway solution.	Data Integration	Provides centralized	Open-Source



			control planes for routing API traffic, enforcing security policies, managing rate limits, and authenticating client access. Serves as a reverse proxy and mediates communication.	(Community Edition) / Commercial (Enterprise) (Inferred)
Prometheus	A time-series monitoring and alerting tool.	Data Integration	Allows for the real-time tracking of API latency, request throughput, and error rates.	Open-Source (Inferred)
Grafana	A time-series monitoring and alerting tool.	Data Integration	Allows for the real-time tracking of API latency, request throughput, and error rates.	Open-Source (Community Edition) / Commercial (Enterprise) (Inferred)
ELK Stack (Elasticsearch, Logstash, Kibana)	Provides powerful search and visualization capabilities for aggregated logs.	Data Integration	Enables developers and DevOps teams to investigate failures and audit usage patterns from aggregated logs.	Open-Source (Community Edition) / Commercial (Enterprise) (Inferred)
Datadog	A comprehensive observability platform.	Data Integration	Combines metrics, traces, and logs in a unified view, which is especially useful in complex multi-cloud or hybrid deployments.	Commercial (Inferred)
Idra	A tool that plays a central role in the data dissemination process.	Data Integration	Enables data publication using the DCAT-AP metadata standard, ensuring uniform and discoverable datasets. Supports federation of datasets from heterogeneous Open Data Management Systems (ODMSs) like CKAN, DKAN, Socrata, and Orion Context Broker, making them	Not Specified (Likely Open-Source)



			available through a single access point.	
Orion Context Broker	A FIWARE component for real-time management of contextual information.	Data Integration	Provides reliable mechanisms for data publishing, subscription, and querying using NGSI interfaces. It is a central component for managing contextual data.	Open-Source (Part of FIWARE ecosystem)
Scorpio Broker	A FIWARE component for real-time management of contextual information.	Data Integration	Provides reliable mechanisms for data publishing, subscription, and querying using NGSI interfaces.	Open-Source (Part of FIWARE ecosystem)
FIWARE Lab	A sandbox environment to test FIWARE implementations.	Data Integration	Provides a dedicated environment for testing.	Not Specified (Likely Free/Part of FIWARE ecosystem)
STH-Comet	A FIWARE component for historical data archiving.	Data Integration	Stores historical data for FIWARE contexts.	Open-Source (Part of FIWARE ecosystem)
Wirecloud	A FIWARE component for creating customized dashboards.	Data Integration	Allows for the creation of customized dashboards.	Open-Source (Part of FIWARE ecosystem)
GeoServer	An open-source server that allows users to share and publish geospatial data.	Data Integration	Supports Web Map Service (WMS) and Web Feature Service (WFS) standards, ensuring compliance with INSPIRE requirements. Enables creation of interoperable web services for viewing and accessing spatial data.	Open-Source
HALE (HUMBOLDT Alignment Editor)	A powerful tool designed for schema mapping and data transformation.	Data Harmonization & Standardization	Especially useful for aligning source datasets to INSPIRE-compliant data models.	Not Specified (Likely Open-Source)
Feature	A tool that offers a visual	Data	Its extensive connector	Commercial

Manipulation Engine (FME)	drag-and-drop interface with over 500 connectors.	Harmonization & Standardization	library supports various formats like shapefiles, GML, GeoJSON, PostgreSQL/PostGIS, WFS, etc...	(Inferred)
INSPIRE Validator	A validation platform used to check whether datasets and services comply with the INSPIRE Technical Guidelines.	Compliance Validation	Offers both online and offline validation modes and supports metadata, data, and service validation, which is essential for ensuring published resources meet EU interoperability standards.	Not Specified (Likely Free/Public Service)
OpenMetadata	A metadata repository. Provides functionalities for metadata support.	Definition of Guidelines	Enables organizations to maintain structured metadata registries, ensuring High-Value Datasets (HVDs) remain accessible and interoperable. Supports role-based access control and compliance monitoring.	Open-Source (Inferred)
Apache Atlas	A metadata repository. Provides functionalities for metadata support.	Definition of Guidelines	Enables organizations to maintain structured metadata registries, ensuring High-Value Datasets (HVDs) remain accessible and interoperable.	Open-Source (Inferred)
DataHub	A data catalogue solution.	Definition of Guidelines	Acts as a centralized repository where metadata is indexed, enabling users to efficiently explore, retrieve, and understand available datasets. Ensures information from different sectors can be easily accessed.	Open-Source (Inferred)
FastAPI (Python)	A lightweight, modular framework for API development.	Data Integration	Facilitates rapid prototyping and integration with	Open-Source (Inferred)



			microservice architectures. Leverages Python's type annotations to automatically generate validation rules and OpenAPI documentation, enabling high developer productivity.	
Express.js (Node.js)	A lightweight, modular framework for API development.	Data Integration	Facilitates rapid prototyping and scalable deployment, making it ideal for multi-service, microservice, or edge-computing architectures.	Open-Source (Inferred)
Spring Boot (Java)	A framework for API development.	Data Integration	Supports rapid prototyping and scalable deployment, ideal for multi-service, microservice, or edge-computing architectures.	Open-Source (Inferred)
Apigee	An API gateway solution.	Data Integration	Provides centralized control planes for routing API traffic, enforcing security policies, managing rate limits, and authenticating client access.	Commercial (Inferred)
Azure API Management	An API gateway solution.	Data Integration	Provides centralized control planes for routing API traffic, enforcing security policies, managing rate limits, and authenticating client access.	Commercial (Part of Microsoft Azure) (Inferred)
AWS API Gateway	An API gateway solution.	Data Integration	Provides centralized control planes for routing API traffic, enforcing security policies, managing rate limits, and authenticating client access.	Pay-per-use (Part of AWS) (Inferred)



Mqa-scoring tool	A tool that calculates the score a metadata obtains according to the MQA indicators and verifies the requirements specified by the MQA.	Compliance Validation	Helps to improve the quality of metadata harvested by the data.europa.eu portal.	Not Specified (Likely Free/Public Service)
Data Models Contribution API Full Test	A tool developed by the Smart Data Models program that allows to validate a certain submission of a data model.	Compliance Validation	Provides feedback if a data model is not compliant with guidelines and contribution manual, and indicates whether properties are already used in other data models.	Not Specified (Likely Free/Public Service)
AJV JSON Schema Validator	A JSON Schema Validator leveraged by the Data Model Mapper tool for validation and reporting.	Data Harmonization & Standardization	Validates resulting objects against the JSON schema corresponding to a target Data Model.	Open-Source (Inferred)
Data Model Mapper	An open-source software developed by Engineering Ingegneria Informatica SpA that enables conversion of various file types (e.g., CSV, JSON, GeoJSON) to different Data Models (NGSI entities).	Data Harmonization & Standardization	Performs input file parsing, streaming to intermediate objects, mapping to NGSI entities, and validation against JSON schema. It can produce a report file and send validated objects to Orion Context Broker or a local file.	Open-Source
KNIME	A data analytics platform with extensible ETL nodes for schema alignment operations.	Data Harmonization & Standardization	Features semantic type detection, controlled vocabulary integration, and workflow-based mapping persistence. Includes visual data transformation editors supporting complex mathematical expressions, conditional logic, and custom scripting.	Open-Source (Community Edition) / Commercial (Enterprise) (Inferred)



