DIGITISATION: ECONOMIC AND SOCIAL IMPACTS IN RURAL AREAS

D3.5 THIRD SET OF PRACTICE ABSTRACTS

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Introduction

This document provides DESIRA's third set of practice abstracts (PAs) which is a compilation of seven PAs. Those PAs are based on the experiences, lessons learned, project actions and reporting of the WP3 activities that aimed in the development of scenarios and showcasing of technologies building on the concept of digital game changers. Tasks 3.5 'Use Case development' and 3.6 'Showcase Technologies', are the main contributing project's tasks that provided concrete results on which these seven PAs, cited in this report, are based on. The first five PAs provide a concise description of five use cases that were developed during the second period of the DESIRA project. An array of conducted activities inside the boundaries of five preselected Living Labs, and with the participation of those LL's stakeholders, were planned so that WP3 could culminated in the development of five technology adoption use cases. The last two PAs of this report, supplement the five aforementioned use case PAs by showcasing two additional promising technology solutions that have the potential to contribute into sustainable digital transition pathways, as those are defined by the DESIRA's theoretical framework and as reflected by the examined agro-rural-forestry settings of this project. For a thorough and detailed analysis of the methodology, activities, and outcomes that contributed to the production of the use cases and showcase technology reports, it is recommended the reading of deliverables D3.3 'Use Cases Report' and D3.4 'Showcase Technology Report' which are the foundation documents on which this deliverable is based on.

Presented Use Case Practice Abstracts

Tab. 1: Summary Table of Use Cases & Use case Statements

Use Cases	Use Case Statement
1. DIGICROFT: GIVING ACCESS TO TRAINING FOR CROFTERS AND SMALLHOLDERS	To provide information on training opportunities on one platform using gamification techniques
2. INTEGRATION OF DATA FOR LAND MONITORING	Integration of data for land monitoring activities.
3. BRINGING PEOPLE TOGETHER	The goal is to bring citizens of different generations and backgrounds together to foster communication and joint activities.
4. ENHANCING WINE PRODUCTION SUPPLY CHAINS	Development of a system responsible for the collection, gathering and analysis of data across the wine supply chain.
5. KEEPING TRACK OF YOUR TIMBER	Provision of global roundwood traceability

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DIGICROFT: GIVING ACCESS TO TRAINING FOR CROFTERS AND SMALLHOLDERS

DigiCroft

Claire Hardy, The James Hutton Institute

Living Lab LL Coigach, Scotland
Use case statement To provide information on training opportunities on one platform using gamification techniques
Key Digital Technologies and Actors Digital platform: DigiCroft. Crofters, smallholders, Crofting federation, crofting commission, Lantra, NFUS, FAS
Keywords DigiCroft; Gamification, crofting, smallholders, training
More info: Coigach LL

The DigiCroft is a digital tool that aims to signpost participants to websites hosting up-to-date current information on training opportunities. The information sources focus on training relevant for crofters and smallholders in remote locations of Scotland. The geographical locations of these actors imply they rarely have a central point of contact, making disseminating information challenging. Equally, those searching for information find it time-consuming to identify relevant training opportunities. Some courses are only open to members of organisations; therefore, access is not equal for all as only those with membership can apply. Many courses advertised are for rural dwelling people that do not own land, and these are not useful to crofters and smallholders, e.g., fencing for a garden is very different from stock fencing, requiring different skills. People spend many hours using all their resources to find appropriate training, at a convenient time and an accessible location.

Small focus groups have been used to gather information about the requirements of end users and to identify already available information resources. Research and developers, at the James Hutton Institute, propose using gamification techniques to entertain players whilst providing signposts to relevant training opportunities. The DigiCroft will deliver clear focused messages within a unique

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environment targeted to engage the crofting (and smallholding) communities. A simulated crofting community environment will be developed by a software developer that will be augmented with 360-degree footage to allow a bespoke experience to be created. The information spheres will deliver information on training opportunities to engage players and inform them on the background of the topic as well as direct them to event pages giving times and dates of training opportunities, allowing players to register their interest. The DigiTool will also provide links to lasting resources that offer learning experiences.

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INTEGRATION OF DATA FOR LAND MONITORING

Livia Ortolani (AMIGO), Fabio Lepore (UNIPI), Alessio Ferrari (CNR)

Living Lab Toscana Nord
Use case statement Integration of data for land monitoring activities
Key Digital Technologies and Actors Smartphone, management software, database, instant messaging apps, email. Data providers, technicians, managers, CDB, farmers, citizens and associations.
Keywords Hydrogeological risk management, land reclamation, database, participation, P.A.
More info: Living Lab Toscana Nord (Italy)

The co-designed technology aims at supporting the work of the local public authority *Consorzio di Bonifica Toscana Nord* (CDB), which deals with land and water management.

The system's objective is to improve the efficiency of hydrogeological risk management in the rural areas under CDB's jurisdiction by enhancing both monitoring and maintenance of the territory thanks to improved communication among the actors involved in this process. The system is based on a web application that integrates data from different sources.

This is achieved through multiple integrated digital technologies [•] and the involvement of different actors [•]. The goal is to **correlate climatic events with maintenance interventions** by using climatic data collected by external **data providers** in **databases**, then used by **CDB's technicians**. Also, **to involve farmers and associations in monitoring the hydrographic network** by connecting them with **technicians** through a digital **interface**. **Lastly, to improve communication i) within CDB** through an **application** - based on a monitoring **dashboard** – to improve data exchanges among **technicians** and **managers**, **and ii) with citizens** thanks to a **smartphone** application collecting intervention requests to CDB staff (**technicians** and **managers**) that, in turn, keeps track of such request on **management software**.

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What may drive the use of this tool are the increasing damages due to adverse effects because of climate change, the need to improve work efficiency within CDB, and the availability of additional resources by both national and local governments for the development of digitisation. The main positive impacts are the improved control of the territory and a consequent reduction of the hydrogeological risk, the involvement of a larger number of actors at different levels, and better management of financial resources within CDB. On the other hand, obstacles to its development may be the management costs of digital tools, and the low incentives for private actors to invest in such a context.

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BRINGING PEOPLE TOGETHER

Matthias Berg & Christof Schroth, Fraunhofer IESE

The members of Rhineland-Palatinate Living Lab have identified challenges such as growing social separation, loneliness, and decreasing exchange between generations in their local community. Furthermore, a lack of venues where people can meet, socialise and do things together exacerbates the problem. Thus, this use case is intended to digitally support social life and integration in the region by facilitating the preparation, realisation and post-processing of physical events and social gatherings.

The case study departs from the idea that citizens, who can be differentiated by several personal traits (e.g., background, age or social groups), are often part of clubs and associations, revolving around specific discussion topics or activities of their interest.

Living Lab Rhineland-Palatinate
Use case statement The goal is to bring citizens of different generations and backgrounds together to foster communication and joint activities.
Key Digital Technologies Web application, mobile & stationary devices; Citizens, clubs, associations, administration, educational institutions
Keywords Civic participation, events, organization
More info: https://desira2020.eu/rhineland-palatinate-germany/

Thus, this use case presents a digital tool to organise and promote different topical events at the regional level. The tool does not only benefits citizens but also local administrations, as they contribute to the aim of keeping the region attractive to newcomers and fostering social cohesion among inhabitants. In such a way, local administrations participate by providing public facilities for the events, while educational institutions contribute to the diffusion across heterogeneous social groups. In addition to supporting the organisation and promotion of events, the digital tool also facilitates feedback and allows collecting documentation and visual materials of events (pictures, videos, etc.) allowing their online publication to achieve a higher impact and publicity of the local initiatives. The tool is based on a web application

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that can be used both on mobile phones and other devices. Existing platforms like Facebook or Twitter, but also local services such as a citizen app or the municipal website, are connected to such tool via proper interfaces. Some challenges identified are the willingness of citizens to organise events and use the app, GDPR-related issues, as well as the appropriate use of collected feedback, criticism and communication etiquette, which should be ensured by community standards and moderation to avoid further division and distance among members of the local community.

September 2022

ENHANCING WINE PRODUCTION SUPPLY CHAINS

Christos Marinos-Kouris, Eleni Toli, Panagiota Koltsida, ATHENA Research Centre

Living Lab
Digital services for rural and farmers' communities
Use case statement
Development of a system responsible for the collection, gathering and analysis of data across the wine supply chain.
Key Digital Technologies and Actors
On Farm IoT modules, Blockchain platforms, Farm Applications, Consumer Applications, Grape growers, Winemakers, Blockchain providers, wine wholesalers &retailers
Keywords
Wine production, traceability, supply chain, blockchain
More info: LL Northern Greece

This use case is based on the development of the LL 'Digital services for rural and farmers communities' and is designed to specify functionalities and delineate tasks and actions that show how LL stakeholders and other relevant actors may adopt and exploit digital tools to achieve given goals. The overall scope of this use case is to enable information flows and facilitate data collection mechanisms throughout the entire winemaking production and distribution process.

The use case has been co-organised by the ATHENA Research Centre and the American Farming School of Thessaloniki and was tailored to the agricultural and winemaking processes of a wide group of grape cultivators and winemakers-owners located in Goumenissa (north-central Greece). The organisers and involved actors aimed to collaboratively experiment with new digital solutions that can provide quality guarantees for the creation and establishment of a distinct local wine product.

The goal of this use case is the development of a system responsible for the collection, gathering and analysis of data across the wine supply chain, starting from grape producers and moving towards vineyards, wineries and finally wine consumers. The system aims to enhance the traceability and security aspects of the products, as well as to increase resilience in the wine value chain while strengthening the position of farmers and wine producers in the market.

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The use case proposes a shift from a business-as-usual management of grape growing, wine production and distribution, towards a customised, real-time and network-connected data-driven management. Data interpretation, decision support and assistance on specific tasks are aspects where demands should be met in terms of the actor's process trust, capabilities, and technical requests. Local grape growers and winemakers call for a wider collaboration with regional authority, scientific, technology and consultancy institutions that operate or have interests in the region, to achieve the integration of new insights, methods, and ICT tools in the winemaking processes. Finally, this use case served as a testing ground to set the foundations and define the specificities that should be considered before adopting digital agricultural tools and services that demand active actor involvement in the winemaking business of Goumenissa.

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KEEPING TRACK OF YOUR TIMBER

Clemens Rendl, SISTEMA GmbH, Sebastian Vogler, BeetleForTech

Living Lab Round Wood Traceability
Use case statement Provision of global roundwood traceability
Key Digital Technologies and Actors GNSS, satellite data, tagging and scanning devices, cloud infrastructure, mobile broadband; loggers, operators and traders, processors
Keywords traceability, roundwood, illegality, biodiversity, deforestation, supply chains
More info: Living Lab Austria

To strengthen forest biodiversity, the Austrian start-up BeetleForTech is providing ways to seamlessly trace single pieces of roundwood throughout the world. The solution developed in-house is based on mobile devices for tagging freshly logged trees on-site, dedicated scanning devices at the wood processing facilities, GNSS technology for the registration of the geolocation of trees, satellite data for verification and cloud infrastructure for centralized storage of relevant information to allow querying for data. Transmission of data is based on mobile (cellular) technologies.

To provide global traceability of roundwood that strengthens forest ecosystem resilience, the involvement of loggers, traders and processors is needed. **Tagging** (task 1), is carried out by the loggers on-site and allows to identify single trunks of roundwood. At the wood processing facility, after the arrival of the individual logged trees, the previously attached tag is automatically registered using a digital scanning technology; a process known as **Registration** (task 2). Additional information, e.g., the transport route provided by the operators and traders, is linked to each registered tree automatically within the system; this phase is referred to as **Combination** (task 3). Finally, the **Verification** (task 4) asses the legality and origin of a single piece of roundwood by performing a query of the database of the cloud infrastructure.

Forests and their importance in the global carbon cycle, as well as deforestation-free supply chains, are now being actively debated. A system of global roundwood traceability could play a key role in fighting illegal logging activities. The positive impact would be a decrease in the loss of biodiversity,

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resulting in a more sustainable future for society. A lack of financing or support, as well as the high costs of system development and maintenance, are significant roadblocks to worldwide roundwood traceability systems.

Showcase Technologies Practice Abstracts

Tab. 2: Summary Table of Showcased Technologies

Showcase Technologies	Description
1. DigiCroft	A virtual training platform designed to help crofters access information on training opportunities. It was developed based on the concept of virtual engagement, to widen access to information on agricultural demonstration activities.
2. Chatbot	An automated system that communicates with users through messaging platforms and can manage simple tasks such as providing information or guiding users through processes. It reduces the workload of operators and provides immediate responses to users.

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DIGICROFT II
WIDENING ACCESS TO TRAINING

Claire Hardy, The James Hutton Institute

The DigiCroft was developed with generic crofting communities in mind, although the community associated with the DESIRA Scottish LL based in the North West of Scotland a peninsula in Wester Ross were key actors.

In this area of Scotland small-scale 'crofts' are the prevalent form of agricultural land holdings, these are registered with the Scottish Crofting Commission, a government body, with associated regulations on their use and maintenance. There are also people that own their own land who are not registered crofters they are smallholders without the need to comply but equally with restricted access to opportunities. The crofting areas are concentrated in remote, upland locations which typically impacts production and commercial viability. The remote nature of the crofts makes it difficult to access inputs and market products, training or employment options.

Living Lab

Scottish Crofting LL

Use case statement

To provide information on training opportunities on one platform (signposting) using gamification techniques to engage and entertain viewers

Key Digital Technologies and Actors

Simulated gaming environment designed to represent a generic Scottish Crofting township, navigable and providing links to signpost viewers to external sites

Actors

Crofters, small holders, stakeholders, SMEs, training providers

Keywords

Crofting; Gamification; training; digital tool, DigiCroft

More info: Scottish Living Lab

Accessing information regarding training opportunities can be challenging for Crofters and smallholders located in remote location and often time poor due to their pluriactive lifestyle. Using gamification techniques the DigiCroft will bring together information from training providers using signposting to direct viewers to external websites and giving equal access to all. The digital tool can be accessed without need for registration and without associated costs.

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DigiCroft uses gaming technology to create a simulated interactive crofting township. The environment has been developed to represent a generic crofting landscape where the land is poor, remote, the grazing is rough, few fences are used and trees are sparse or limited to planted woodland areas. Viewers are able to locate signposts to available resources by navigating the environment using standard gaming keys and a mouse. To provide quick navigation (and further entertainment) the site quad bike can be used.

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LAND MANAGEMENT IN MOUNTAIN AREAS

Manlio Bacco, Alessio Ferrari, Nicholas Fiorentini (CNR) Livia Ortolani (AMIGO), Fabio Lepore, Gianluca Brunori (UNIPI)

The managing body "Consorzio Toscana Nord" (CTN), a public entity located in Tuscany, Italy, manages river basins and hydraulic works in a mountainous area of about 360.000 hectares. There, land abandonment and the occurrence of extreme events in the last years, such as floods and landslides, are impacting negatively.

In order to better address the situation, CTN has introduced several digital tools (e.g., instant messaging and WebGIS) to facilitate communication with citizens in the area to receive intervention requests. Such requests, mainly via instant messaging, could be rather high in number in some periods of the year, and the IT personnel, in limited number, may struggle to keep up.

In the context of the DESIRA project, a digital tool - in the form of a chatbot - has been co-developed to support the management of such requests. The key objective was to partially automate the process, from citizens' reporting to the implementation of appropriate intervention measures.

A chatbot is a familiar and easy-to-use tool, based on Telegram in our case. It has the potential for

Living Lab

Tuscany, Italy

Use case statement

Integration of environmental and human monitoring with land management to improve efficiency and answer citizens' requests

Key Digital Technologies and Actors

Telegram-based chatbot, database Farmers associations, citizens, CTN

Keywords

chatbot, land management, e-governance

More info: https://desira2020.eu/tuscany-italy

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reducing the operators' workload: by automating the management of simple tasks, such as requests for information/interventions, technicians can address other tasks and intervene only if the chatbot cannot meet users' needs. The service can be used at any time and with immediate response.

Through the chatbot, the local community can better participate in the process of land management using an e-governance tool for improved exchange of information. It aims at supporting maintenance activities to reduce hydrogeological risks, thus it has been welcomed by all the actors in the area.