MUSHNOMICS

Unlocking data-driven innovation for improving
productivity and data sharing in mushroom value chain

D6.4 - Roadmap for Knowledge exchange, Communication and Impact Maximization

Document	
Deliverable title	Roadmap for Knowledge exchange, Communication and Impact Maximization
Related Work package	6
Responsible editor	UCD
Contributors	Dimitrios Argyropoulos, Daniela Delinschi
Delivery date	M06

Version history			
Author	Comment	Version	Date
UCD	Draft	0.1	
HS	Draft	0.3	
UCD	Final	1.0	M06

Disclaimer

This document may contain material that is copyright of certain MUSHNOMICS beneficiaries and may not be reproduced or copied without permission.

All MUSHNOMICS consortium partners have agreed to the full publication of this document. The commercial use of any information contained in this document may require a licence from the proprietor of that information.

The MUSHNOMICS Consortium is the following:

No	Beneficiary Name	Short Name	Country
1	SC HOLISUN SRL	HS	Romania
2	Department of Plant and Environmental Sciences, University of Copenhagen	UCPH	Denmark
3	Pilze-Nagy Ltd	PILZE	Hungary
4	University College Dublin	UCD	Ireland
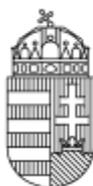
The information in this document is provided "as-is" and no guarantee or warranty is given that the information is fit for any particular purpose. The user thereof uses the information at its sole risk and liability.

Table of contents

Acronyms

AI	Artificial Intelligence
IoT	Internet of Things
3PL	Third Party Logistic

1. Introduction

This document represents a deliverable, D6.4 – Roadmap for Knowledge exchange, Communication and Impact Maximization, of the MUSHNOMICS project funded by ICT-AGRI-FOOD (Horizon 2020 programme) of the European Union under Grant Agreement number 862665.

MUSHNOMICS's Dissemination and Communication Plan is an important element for the success of the project initiatives to create awareness of its on-going results. This document provides a roadmap for knowledge exchange, communication and impact maximization including several activities to ensure project awareness and impact on the community, its activities and technologies.

The plan describes channels, mechanisms and activities to deliver the main project messages to different target groups during the 36 months of the project.

The proposed report will define objectives and goals for dissemination activities, identify target groups, define dissemination and communication channels, tools and media to be used, and define key messages that will be used to reach identified communities.

The Dissemination and Communication Plan (D6.4 – Roadmap for Knowledge exchange, Communication and Impact Maximization) will be used for building effective and coordinated project activities as well as creating national and international awareness of the project results.

2. Project Background

Mushroom cultivation represents a remarkable example of sustainability in practice. It is a direct utilization of their ecological role in the bioconversion of solid wastes generated from industry and agriculture into high quality food with exceptional nutritional value.

Commercial edible mushroom cultivation is a 'big business' world-wide with a total production exceeding 27 million tons, a 25-fold increase during the last 35 years, which is combined with a high increase in the respective per capita consumption. Among them, several species of the genus *Pleurotus* ('oyster mushrooms') are of particular interest since they can transform agricultural residues into edible mushrooms of high nutritional and medicinal value.

Nowadays, production of *Pleurotus* species amounts to ca. 30% of the total and corresponds to the fastest growing and most profitable section of the mushroom market during the last two decades. Especially *Pleurotus ostreatus* is commonly grown on pasteurized wheat or rice straw; however, oyster mushrooms can also be cultivated on a wide variety of lignocellulosic substrates, enabling them to play an important role in managing organic wastes whose disposal is problematic.

The composition of mushroom substrates is anticipated to exert an effect on mushroom yield thus optimization of relevant bioprocesses to maximize yields is absolutely essential. This can be achieved by quantifying the effects of environmental factors such as temperature, humidity, oxygen, carbon dioxide and light throughout the mushroom production process. There are data available from commercial growers, however, is of variable duration, due to commercial considerations.

To this end, data can be collected and analysed in a systematic manner over the production processes along the mushroom production process in order to quantify the effects of different environmental schedules on mushroom yield.

The agri-food value chain has entered an era of digitally enabled processes, where data can be generated during all operations along the supply chain. Agriculture and food production are becoming increasingly data driven. In the mushroom sector, data can be collected over the various processes along the mushroom production cycle in order to optimise environmental schedules in different production setups, increase productivity and consequently mushroom yield.

Digital agriculture in turn goes beyond primary production and influences the full supply chain. New technologies provide solutions for automated data collection and analysis along the mushroom supply chain. ICT and digital predictive innovations as the new frontier that can offer real-time information flow to the citizen, will be used as a very valuable tool to enable yield monitoring, traceability and implement waste utilisation logistics.

MUSHNOMICS will apply technology to gather data from vast networks in real-time, transmit these data to Cloud, develop large data banks, undertake data analytics to deliver mined and collated data to stakeholders in real-time.

The MUSHNOMICS consortium is a close collaboration between research and industry with the shared goal of developing novel digital technologies for process control in an IoT-based, environment-controlled, container-type mushroom production module, as representative case of an innovative circular agri-food system, while also processing production data and optimizing yield.

The MUSHNOMICS consortium includes leading research institutions and key industrial partners from the agri-food (e.g., mushroom industry) and IT sectors that bring substantial experience in their areas of expertise to the project. It will bring technologies and systems from ~Technology Readiness Level (TRL) 4 to ~TRL7 within the 3 years of the project.

A post-project commercialisation plan will bring commercially promising technologies/systems to TRL8 and TRL9, ensuring MUSHNOMICS will have an enduring impact by achieving sustainable use of urban organic wastes and digital technologies, leading to the realisation and strengthening of this agri-food sector.

3.   Aim of the Communication & Dissemination Plan

Through the proposal, MUSHNOMICS has agreed to put in place a clear and structured Roadmap for Knowledge exchange, Communication and Impact Maximization (i.e., Communication & Dissemination Plan) to meet the requirements of the research, and several stakeholders, such as the public, and the national funding agencies including H2020 ICT-AGRI-FOOD.

MUSHNOMICS Communication & Dissemination Plan will include a comprehensive series of actions to broadcast the non-confidential results that are generated during the project to as wide and relevant an audience as possible in order to heighten awareness about the results, to contribute to knowledge building in Europe, and to ensure that as many actors and citizens as possible have access to these results.

The purpose of this Communication & Dissemination Plan is:

1. To identify and design activities to have an impact on its audience (those that can contribute to the development, evaluation, uptake and exploitation of the project outcomes);

2. To ensure that the research and outcomes of the project are widely disseminated to the appropriate audience, at appropriate times along the project lifecycle.

To maximise the impact on stakeholders outside of the Consortium, it is imperative to ensure that the project is focused on the innovation needs of the mushroom and the wider agricultural sector:

- The knowledge gained is made available to all interested groups;

- The project outputs can be effectively exploited.

4. Target Audiences

The communication, dissemination and exploitation of the results drawn from the project activities is one of the key enablers of the success of MUSHNOMICS.

To engage stakeholders of the MUSHNOMICS project and to ensure the successful dissemination of the project results, the focus of the project's communication plan is to target the entire mushroom sector and the wider agricultural value chain in the four countries and at an European level. Stakeholder engagement is fundamental to the success of any communication activity and as such, stakeholder identification is key.

The interested stakeholders identified below are quite varied. To facilitate with the development of an effective communication plan, potential interested parties are grouped as follows:

- Mushroom and wider agricultural supply chain actors (in a farm-to-fork approach): suppliers of raw materials and inputs (e.g. spawn and substrate producers); cereal farmers; mushroom growers; postharvest experts; storage operators; processors; retailers; restaurants; caterers; canteens; coffee shops.

- Technology enablers: machinery providers; IT experts.

- Mushroom business ecosystem: start-ups, SMEs and larger companies.

- Mushroom associations and industry multipliers: Sectoral European and national associations (e.g. Copa Cogeca, European Mushroom Growers Group (GEPC); European Mushroom Working Group- EMushWG, etc.); Hessische Landesfachgruppe Pilzbau (HLP); Bund Deutscher Champignon- und Kulturpilzanbauer (BDC e.V.); CMP – Commercial Mushrooms Producers Ltd, etc.

- Advisory bodies: environmental consultancies and engineering; waste management companies.

- Society: Public and consumers, public and Mass media (e.g. Mushroom Business).

- Policy makers: Standardization bodies and policy stakeholders; national food safety authorities; EFSA; EC; national governmental bodies; governments.

- Research and education: Research and academic stakeholders e.g. International Society of Mushroom Science (ISMS); Teagasc; early-stage researchers; extension services.

- Cross-cutting projects: Previous and ongoing H2020 projects including the projects funded under ICT-AGRI-FOOD, national projects and EIP-AGRI.

5.   Tools & Channels

In keeping with the general profile of each target audience, the most appropriate dissemination tools and channels will be selected for targeting each and the expected impacts of our dissemination activities are also defined as follows:

- Project related: Project corporate identity tools (logo, tag lines/slogan), website, leaflets, posters, video clip (for YouTube, project website, etc.), PowerPoint presentations, and press releases.

- Comprehensive end-user material: EIP-AGRI practice abstracts, tutorial videos, factsheets describing the postharvest best practices.

- Trainings and demonstrations: physical and e-training workshops and on-farm demonstrations.

- Trade fairs/exhibitions: Alimentaria (ES); Anuga (DE); SIMA (FR); Agrotech (PL); GFIA (AE); Fruit Logistica (DE); SIAL (FR); Mushroom Days (NL).

- Conferences, seminars and workshops: e.g. participation in organising, scientific committees, with poster, paper, presentation, or chairing: International Society of Mushroom Science (ISMS); Institute of Electrical and Electronics Engineers (IEEE); International Federation of Automatic Control (IFAC); European Conference of Precision Agriculture (ECPA); events of European and national Mushroom Growers' Association, etc., ICT-AGRI-FOOD programme seminar and meetings.

- Magazines: Mushroom Business; Farmers Journal; Farmers Weekly etc.

- Open Access Journal Articles: e.g. Agricultural Systems; Journal of Biosystems Engineering; Journal of Computers and Electronics in Agriculture; Precision Agriculture, etc.

- Involvement in networks/clusters: EIP-AGRI; EUVRIN, European System of Cooperative Research Networks in Agriculture, etc.; policy roundtables.

- Features in Newsletters and e-bulletins.

- Visibility on Web portals e.g. www.gombaforum.hu; https://www.der-champignon.de/.

- Inclusion in EU dissemination resources such as the EU Horizon Magazine and the EIP-AGRI website http://ec.europe.eu/eip/agriculture.

- Mass media e.g. Euraktiv and social media (twitter, LinkedIn, Facebook etc.).

6.   Communication Strategy

The communication strategy of MUSHNOMICS has been developed to achieve an integrated and consistent information flow both from the project to all the target segments identified in 'Target Audiences' as well as internally within the consortium. It is also intended to avoid disparate messaging efforts.

Ultimately, it will allow the partners of the project to create and distribute information that, even being different in style and objective, has an inner coherence. This consistency will prevent contradictory messaging to different target segments across all media platforms.

Communicating the MUSHNOMICS project's messages is vital for achieving the desired impact and needs to be tailored to the specifics of various target audiences.

The following, among others, is defined for the communication strategy:

1. Promote wide dissemination and raise the visibility of project results;

2. Facilitate interactions with relevant stakeholders;

3. Engage multipliers and future adopters.

Website & Social Media

The MUSHNOMICS website (https://www.mushnomics.org/), Twitter and Facebook accounts are the project's main online communication tools with the LinkedIn profile being used to connect to interested professionals and organisations as well as posting articles on relevant topics and/or project achievements.

The information contained on the website will be reviewed periodically for possible improvements that will contribute towards the development of the user experience. Aside from the information displayed on the website itself, the website will also act as the access portal for the project platform. The platform will be used to disseminate content generated throughout the project mainly through:

- News section - any interested visitors will be able to access the news generated by the project, i.e., main events, milestones, progress of the project, etc.

- Links to Social Networks - the main page of the website displays the project's twitter feed on a rotating banner.

Table 1 MUSHNOMICS Website and Social Media

Social Network	Link	Visual
Website	https://mushnomics.org/	
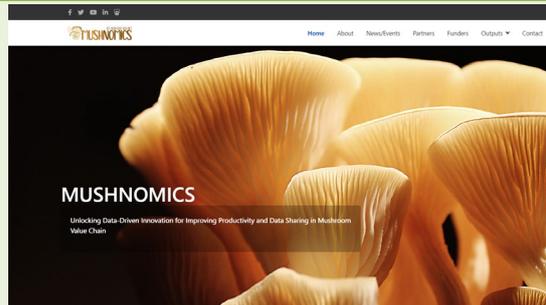
Twitter	https://twitter.com/mushnomics	
Facebook	https://www.facebook.com/mushnomics	
LinkedIn	https://www.linkedin.com/company/mushnomics-project	
SlideShare	https://www.slideshare.net/MushnomicsProject	
YouTube Channel	https://www.youtube.com/channel/UClUfGcLBpSVK1kxZFykrzvQ	
ResearchGate	https://www.researchgate.net/project/MUSHNOMICS	

Press Release

Throughout the lifespan of the project, significant breakthrough accomplishments and events will be identified and sent to online and offline communication media (both national and European). For example:

https://ictagrifood.eu/
https://horizon-magazine.eu
http://horizon2020projects.com/publications/

Conference & Congress

MUSHNOMICS will take part in different congresses and conferences around the world, some of which have been already identified are detailed previously (5. Tools & Channels). Diverse visual corporate material, created ad-hoc, will be used at these and other events, such as rollups, brochures, leaflets or posters aimed at increasing the visibility of the project.

Workshops & Training activities

Work Package 1 will focus on mushroom value chain dynamics. In month 8 a market report on sustainable mushroom value chain will be delivered; profiling current activities, relationships and a comprehensive constraints analysis. In month 12 a further update report will be delivered incorporating findings and opportunities identified through the stakeholder engagement activities, across the mushroom value chain and beyond (e.g., wider agri-food and bioeconomy).

Work Package 4 will focus more on providing in-depth opportunities to transfer knowledge to mushroom scientists, industry and policy makers via the MUSHNOMICS Digital Platform. This also includes enhancing awareness amongst the next generation of urban (mushroom) farmers and students via the MUSHNOMICS education programme and bespoke e-delivery routes.

Work Packages 5 and 6 will focus on stakeholder workshops to bring together key players to identify important resources, constraints and opportunities. It is planned that the workshops will conclude with agreement on the priority areas and actions, to define the focus of business models.

Participation in common events

A key feature of MUSHNOMICS is that it aims to capitalise on the outputs and learnings of completed and ongoing international research and innovation activities. First of all, the project will build on prior state-of-the-art as well as IP belonging to project partners. A selection of relevant R&I actions that the partners are/have participated, and research efforts will be used to feed into the project. Participation in events/initiatives organised by the EC services, joint events of ICT-AGRI-FOOD funded projects.

MUSHNOMICS has a strong external liaison programme focusing on maximising synergisms with all selected projects under this topic, with other relevant projects funded under H2020, e.g., Ploutos, SmartAgriHubs, Co-Fresh, FoodShift2030, BIOSCHAMP, SoftGrip in addition to a number of highly relevant nationally funded and Interreg funded initiatives.

Researchers from UCD are strongly involved in EIP-AGRI and other agri-food networks and will ensure efficient exchange of information with the Focus Groups as well as specific EIP Operational Groups.

Digital Platform

MUSHNOMICS will develop a digital platform, an integrated knowledge platform, as a major channel for building a stakeholder community, facilitating engagement, communication, knowledge exchange and dissemination across stakeholders, which will be compatible with the ICT-AGRI-FOOD network in order to ensure long term accessibility of results. The digital platform will be an enduring communication and dissemination channel for the project, and our aim will be to attract a large community of users to the platform so that it becomes the 'go-to' channel for people and organisations (from across the value chain) who are interested in sustainable digital technology solutions across Europe.

Public Events/Outreach

Work done by MUSHNOMICS will be disseminated to society in general through different public events. These will explain the main objectives, results and benefits of the project in non-technical language. These events will be held both nationally and internationally. For example:

At the Mushroom Days in the Netherlands, which is Europe's largest Exhibition and Mushroom Trade Show; Dutch Mushroom Days; De Nationale Paddenstoelendag; All Ireland and UK Mushroom Conference & Trade Show; EuroScience Open Forum (ESOF) is a biennial, pan-European, general science conference dedicated to scientific research and innovation; Oxford Farming Conference (OFC) is an annual conference for UK farmers that invests in agricultural education and knowledge sharing.

Exploitation Strategy

Innovation management will be directed towards ensuring that an effective innovation cycle is in place to support the development of innovative products and business models from the different stages of the work plan. Our approach is to mobilize co-creation with researchers, IT enablers, and end-users; utilize brainstorming and outreach; and incorporate other tools to ensure the cooperation of the actors that need to be involved to ensure a successful outcome.

This will translate the outputs into practical solutions and training materials based on a co-creation effort which will encourage new ideas for product development, manufacturing, marketing, and business models along the mushroom value chain. The publicly funded nature of this research also avoids the impediments of intellectual property rights, as the primary purpose is the dissemination and evaluation of practices such as the MUSHNOMICS Module.

The innovation management process will be based on a 'pulled' process in which we will identify areas where the needs are currently not met and then focus on designing solutions to these problems along the mushroom value chain. A deep understanding of the industry needs, constraints regulatory/standards framework is necessary, which is gained through our comprehensive multi-functional consortium.

Through sound innovation management we will ensure effective co-creation development that can be guided by feedback loops from fellow researchers, developers, end-users, stakeholders and marketing teams to fuel an innovation cycle that leads to exploitable project results.

Project logo

The full logotype: The MUSHNOMICS Masterbrand or Corporate Logo comprises two elements, the logo symbol and logo type.

Use of any stylized, animated, hand drawn, or other versions of an unofficial logo is not permitted. This undermines the logo system and brand consistency.

The background will be generally white.

The logo (with or without Wi-Fi symbol) selected for the project is available in different formats: jpg, png, pdf.

Basic horizontal logotype

Basic vertical logotype

Corporate typography: The typeface used to create the logo is Adobe Photoshop. Locanita (primary font) typography will be used as a tool to communicate the needs of the project both internally and externally. When use of Locanita is not possible, use Avocado Creamy font family.

Corporate colours: The corporate colours of the brand are registered (#ba7c26 - Light Brown; #825007 - Dark Brown), which should serve as a guidance document to avoid printing problems with the colours of the trademark and its corresponding versions for digital formats.

Using the logo with the EU emblem: The name of the EU programme can appear with the EU emblem. However, no graphical mark (i.e., logo) shall be created using the EU emblem and name of the project. The placement of the EU emblem should not give the impression that the third-party promoter is part of the EU institutions. Therefore, it is recommended to place the EU emblem well apart from the logo of the third-party organisation.