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GATES
SMART FARMING SIMULATION PLATFORM

Applying GAming TEchnologies
for training professionals in Smart Farming

Document Summary

Deliverable Title: **GATES. D1.3 Second update report on Data Management Plan & Support Pack**

Version: **v2.0**

Deliverable Lead: **Agricultural University of Athens (AUA)**

Related Work package: **WP1: Project Management**

Author(s): **Panagiotis Stamatelopoulos**

Contributor(s): **Zisis Tsiropoulos, Spyros Fountas**

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Project coordinator**: Agricultural University of Athens (AUA)**

Abstract

This deliverable contains the Data Management Plan (DMP) of the GATES project along with the corresponding Support Pack that provides recommendations and guidelines to partners on how to collect, generate, manage and re-use the GATES data. More specifically, this document is a report that specifies how research publications and data will be collected, processed, monitored, catalogued, and disseminated during the project lifetime, as well after the end of the project. It also includes a Support Pack with guidelines aimed at the project coordinator and the partners, explaining how they should practically apply the guidelines during their research activities and the data collections.

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Revisions

Rev. No	Release Date	Release purpose
1	June 2017	First Version of DMP (D1.2)
2	July 2018	Second Version of DMP (D1.3) Updates: Dataset No 1, Dataset No 2, Dataset No 4, Dataset No 6, Dataset No 8, Dataset No 11

Introduction

This deliverable (D1.2) is the second and updated version of the Data Management Plan (DMP) for the GATES project. GATES is a HORIZON 2020 beneficiary project for the "H2020-ICT-2016-2017" call; therefore, the updated DMP is submitted through this deliverable, followed by the final review DMP at month 30.

What is a DMP

Data Management Plan (or DMP in short), is an official document that defines the research data life cycle within the project. The data life cycle is a collection of the steps that data must go through to ensure proper management and reusability of the collected and/or generated data. Though it may slightly differ between projects based on the nature of the data. The foundation of every data lifecycle is depicted in Figure 1 and includes the following steps: 1) creating data, 2) processing data, 3) analyzing data, 4) preserving data, 5) giving access to data and 6) re-using data.

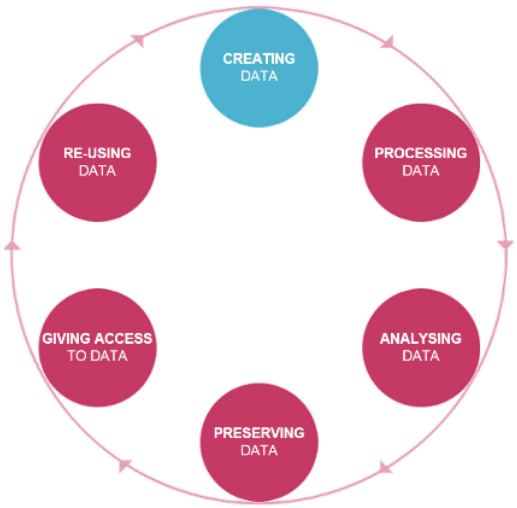

Figure 1 Data lifecycle

The purpose of the Data Management Plan is to assess and define up front all of the aspects of data management, metadata creation, analyzation and storage, and to ensure proper and sound management of the research data that will be collected, processed and generated within the GATES project.

Objectives of the initial DMP

The current deliverable has on purpose to ensure proper and sound management of the research data that will be collected, processed and generated within GATES. The concrete objectives of the document are to (a) detail the handling of research data during and after the project, (b) describe the methodology and standards required, (c) identify whether and how data will be shared, exploited or made accessible for verification, and re-used, and (d) identify how they will be curated and preserved.

DMP is constantly evolving

DMP is not an "isolated" deliverable. It begins at day one of the project and aims at defining all of the data management details, but it constantly evolves and gains precision and substance throughout the lifespan of the project.

Methodology

The European commission has issued a document called "*Guidelines on FAIR Data Management in Horizon 2020*"[1]. This document serves as a guideline to assist the HORIZON 2020 beneficiaries on the creation of the DMP and introduces the FAIR principle. According to the aforementioned document, "*Horizon 2020 beneficiaries should make their research data **F**indable, **A**ccessible, **I**nteroperable and **R**eusable (FAIR), to ensure it is soundly managed*". Additionally, the document provides its reader with a DMP template in ANNEX 1, outlining all the sections that a HORIZON DMP deliverable must contain along with aid in the form of questions to be answered for each section.

Furthermore, EU has published an "Open access & Data management"[2] guideline to "explain the rules on open access to scientific peer reviewed publications and research data that beneficiaries have to follow in projects funded or co-funded under Horizon 2020". OpenAire[3], has issued a similar document called "Briefing Paper Research Data Management"[4], in which it demonstrates the need for a DMP and how to draft one. Furthermore, OpenAire, in cooperation with EUDAT[5], has conducted webinars on the subject and has publicly posted them online[6].

GATES consortium, after careful consideration of the previously mentioned material, drafted this initial DMP document, using the template provided by the European Commission and the knowledge extracted from the other sources. Each of the following sections represent a specific dataset of the GATES project.

Dataset No 1: Project Management derived data

Data Summary

The purpose of this dataset (data collection) is to document all of the data produced during the Project Management Activities from the consortium of the GATES project. In the scope of this dataset, the following data types are expected:

Presentations: Several PowerPoint presentations have already been created (project meeting presentations etc) and more will be created during the projects lifespan. The purpose of these presentations will vary, depending on whether it's a dissemination material responsible of promoting GATES or if it's part of a deliverable. These files will be created by the project member responsible of each deliverable and will be sent to the coordinator in the form of .pptx files, using Microsoft PowerPoint software. The size of the presentations cannot be estimated as it varies depending on the multimedia (images, videos, animations) it will contain.

Meeting records: In the lifespan of the project, five (5) coordination meetings will be held where the partners will physically meet, discuss and resolve potential issues. Furthermore, online meetings via skype will also be held for micromanagement and immediate problem assessment. In the scope of these meetings, minutes will be produced, documenting the purpose of the meeting, the members involved, the location and the bullets of the discussions followed by a synopsis. The documents will be saved as word (.docx) and PDF (.pdf) files, stored by the project coordinator in GATES private server and used by the GATES members as a reference on what has been discussed and decided. The size of these documents will not exceed 2Mb each in storage space.

[1] https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

[2]https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/open-access_en.htm

[3] https://www.openaire.eu

[4] https://www.openaire.eu/briefpaper-rdm-infonoads

[5] https://www.eudat.eu/

[6] https://eudat.eu/events/webinar/research-data-management-an-introductory-webinar-from-openaire-and-eudat

Deliverables: The Project Management dataset will produce four (4) deliverables:

1. **D1.1 Project Management Handbook:** to present the main aspects related to GATES management summarizing the organizational structure, operating procedures and management tools of the project.
2. **D1.2 Data Management Plan & Support Pack:** specify how data will be collected, processed, monitored, catalogued, and disseminated during the project's lifetime.
3. **D1.3 Project Interim Report:** To document the progress of the project mid-term
4. **D1.4 Project Final report:** a summary of GATES project activities and work.

The responsible partner of each deliverable will document it and deliver it to the consortium in the form of a word document(.docx) for review before the submission to the EU portal, whereas, the final version will be saved as a PDF document(.pdf) and stored in the projects private server repository. The expected size of each deliverable is estimated to be around 4-5Mb

No existing data will be used or reused for neither of the previously mentioned data. On the contrary, new data will be created during the lifespan of the GATES project. Furthermore, these data will be useful mostly between the project partners as a reference tool, but could also be useful to external researchers who want to reflect on the project management structure.

Fair Data

Making data findable, including provisions for metadata

At the moment, the use of metadata for the project management dataset has not been decided, mainly because most of this dataset is confidential and will not be made findable. Additionally, no versioning is required since the data will be in pdf format and will not be able to change in the future.

The deliverables which will be openly available, will be publicly hosted in the web portal, so any interested party will be able to access them via the navigational menu and the search bar by querying the name of the deliverable (i.e. data management plan). The naming convention of the data was decided to be:

- GATES - Data Management Plan deliverable.pdf
- GATES - Interim Report deliverable.pdf
- GATES - Final Report deliverable.pdf

Making data openly accessible

The data in this collection, except for the three aforementioned deliverables, will not be openly available as they are confidential as a part of the inner-processes of the project and only accessible through the members of the consortium. They will be stored in a folder on the projects private server, which will be shared only with the partners of the project.

All of the deliverables (public or confidential), will be available in a pdf file format, which can be opened with the use of the "Adobe Acrobat Reader" software (free). The deliverables will be openly accessible without any restrictions.

During month 18 that this deliverable is written, the first version of the *Data Management Plan* and the *Interim report* deliverables have already been submitted to the SyGMa platform and have been flagged as **submitted**. The coordinator of GATES in conciliation with the partners is waiting for both of them to be formally labeled as **approved** and then upload them to the projects' portal to be available to the public.

Making data interoperable

Not applicable for this particular dataset.

Increase data re-use (through clarifying licenses):

As identified in the previous sections, most of this dataset will not be openly accessible, so in extend, there can be no data re-use for it. For the deliverables that are openly accessible (D1.2, D1.3, D1.4), the "ODC Public Domain Dedication and Licence" will be used to allow potential parties to freely use them. The quality of the data will be assured by the consortium and will be made available from the moment they are uploaded in the web portal (www.gates-game.eu) for as long as the website is up and running.

Allocation of resources

All of the costs regarding the project management activities have been estimated and included in the budget of the project in the form of person months for Work Package 1.

Data Security

All of the documents derived by this dataset will be stored in GATES private server and shared with the members of the consortium. The pdf files of the three public deliverables will also be hosted in the server of the web portal, following the security protocols of the hosting service. The private server will perform periodical backups to a secure external location to ensure data recovery.

Ethical Aspects

The data collected in the reports of the meetings, where the position of each member is recorded, falls into the "ethical aspect" area. In extend, every participant of the meeting will be informed on the record keeping of the conversation and will have to give his consent up front of the stat of the meeting.

Other

Not applicable.

Dataset No 2: User requirements data

Data summary

The purpose of this dataset is to identify the strengths and weaknesses of the customer segments and end-users together with their requirements and expectations. The requirements will be used for establishing the template to gather data flow information, the definition of the process model and the definition of the learning strategies based on customers and end-users' needs.

To that end, the partner from Serbia (InoSens), designed a questionnaire which was answered from farmers (InoSens, Serbia), agricultural students (AUA, Greece), smart farming technologies specialists (ANSEMAT, Spain) and company representatives (ANSEMAT, Spain). The completion of these questionnaires provided the consortium with data regarding: demographic information, general information, behavioral requirements (functional) and development quality attributes (non-functional).

This dataset consists of a Microsoft Word document (.docx) that is the questionnaire that was used and is approximately ~33Kb and a Microsoft Excel document (.xlsx) which is the result of the processing of the survey input. Furthermore, from this dataset a user requirements deliverable is created (D2.1), presenting the information that was extracted.

Finally, this dataset will be extremely useful first of all to the consortium itself for designing GATES as effective as possible and then for researchers that require data on the end-user needs in an educational game. No existing data will be used or reused.

FAIR Data

Making data findable, including provisions for metadata

The complete dataset is hosted in the private server of the system and shared between the members of the consortium. The results of the analysis (in form of document) will be hosted in the server of the web portal to be made publicly available for users to download upon EU approval. No metadata was created, since this dataset is not to be altered in the future, thus, no versioning is required. The users will be able to locate the desired document using the navigational menu of the web portal and by querying with the keyword “user requirements” in the search bar.

Finally, the following naming convention is used for this dataset:

- GATES_WP2.1_User_requirements_deliverable.pdf
- GATES_WP2.1_Questionnaire_results.xlsx

Making data openly accessible

The deliverable along with the template of the questionnaire will be openly available via GATES web portal without any restrictions on the access. The questionnaire results file containing the responses of the participants will be kept private as it contains confidential information, but the insight extracted by the analyzation of those answers will be part of the deliverable and publicly available.

The deliverable is a pdf file which can be accessed via the Adobe Acrobat Reader (Free).

The user requirements deliverable has been uploaded to the SyGMa platform and labeled as **submitted**. The consortium has agreed upon waiting for the deliverable to be flagged as **approved** before being publicly uploaded to the projects web portal. The questionnaire of the user requirements analysis survey is incorporated into the deliverable under the Annex 1 section; where the questionnaire results excel file is stored on the projects’ private folder and flagged as private.

Making data interoperable

The deliverable file will be “as is” in a pdf format and can only be used as a reference, whereas the template of the questionnaire will be in a Word document format which is the most commonly used text format and also allows the user to export it in multiple formats and further process it.

Increase data re-use (through clarifying licenses):

This insight extracted by the analyzation will be openly available in the website of the system and with no restriction for anyone to use according to his needs based on the PDDL licence. The data will be made available for re-use from the moment it is uploaded in the web portal and will remain reusable for as long as the website is up and running. The quality of the data will be assured by the GATES team through validation tests on the inputs.

ALLOCATION OF RESOURCES

No additional cost is required for this dataset as it is included in the person months cost of WP2.

DATA SECURITY

Since the deliverable document is openly available in the web portal no extra security measurements are needed. The data will also be stored in the projects private server for safekeeping and periodical backups to external server will ensure data recovery in any case of server failure.

ETHICAL ASPECTS

The data in the questionnaire results excel file fall into the ethical aspect area. The original questionnaire results contain personal information of the participant and cannot be made public. To maintain the anonymity and privacy of the respondents, the questionnaire results excel file will be private in the server and restricted even among the

partners. The coordinator (AUA) is responsible of maintaining the anonymity and distribute the file in the interested partners with caution.

OTHER
Not applicable

Dataset No 3: Material Collection Data

Data Summary
The purpose of this dataset is the development of the content that will be used for teaching and improving learner's SFT skills. This internal material database will be used to support management and monitoring of all the collected materials during the project implementation phase.

The sources of the collected material will be the World Wide Web, digital and printed material which will be digitized. The collection is still in its infancy steps, thus, no prediction can be done to the size of the database.

This dataset will serve a vital role in the development of GATES, providing the educational content for the developers to incorporate into the game.

FAIR DATA

Making data findable, including provisions for metadata
The material collection dataset is placed in the project private server and shared with the consortium members only. This dataset is confidential as GATES is a commercial project, thus, no procedures to make it findable will be conducted. This dataset is accompanied with metadata, allowing the detection of outdated material. The metadata information are:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
Material production age	The year the material was produced
Resource type	The format of the dataset
Date	The date this dataset was collected

Making data openly accessible
Not applicable. (Confidential Data)

Making data interoperable
Not applicable. (Confidential Data)

Increase data re-use (through clarifying licenses)
Not applicable. (Confidential Data)

ALLOCATION OF RESOURCES
Not applicable. (Confidential Data)

DATA SECURITY
The data will be stored in the projects private server following its security and backup protocols.

ETHICAL ASPECTS
Not applicable. (Confidential Data)

OTHER
Not applicable. (Confidential Data)

Dataset No 4: Current Smart Farming Technologies (SFT) data

Data summary

The purpose of this dataset is to assist/enable the creation of the algorithms and models for developing the main game mechanics of GATES related to the simulation of the agricultural environment and the environmental and economic benefits of using SFT. The source of this dataset was the outcome of an investigation on the current SFT (machinery, actuators, sensors, services, methodologies) in terms of yield, power consumption and CO2 emissions. The "Material Data Collection" dataset (No 2) will be re-used by the consortium for the investigation.

This generated data exist in the following formats:

- C# code git repository containing all of the agricultural algorithms
- A Microsoft Excel document (.xlsx), listing the current SFT machinery with its average market price and benefits in terms of fuel reduction, efficiency and quality.
- An Adobe Reader PDF file (.pdf), deliverable 2.2, where the material collected in Task 2.2 (Material collection, classification and evaluation) was converted to algorithms and was modelled and documented for developing the main game mechanics of GATES.

The git repository containing the algorithms is hosted in the private server of the *Mad About Pandas* and strictly accessible only by their developers and the *AUA* developers that assist on the algorithm creation.

The SFT list excel file, is hosted in the projects private folder and at the moment this deliverable is written is approximately 13Kb. It is not yet finalized as it only contains the SFTs that are supported in the current version of the game (MVG2) and it is constantly updated with new data as the game development evolves. The following table shows the data structure of the excel file:

Parameter	Input	Unit	Description
Name/ID		txt	Unique name to identify SFT.
Type		List (Sensor Machinery Service)	Type of machine.
Area		List (Tillage, Seeding, Irrigation etc.)	Agricultural operation the SFT is used in
Crop		List of available crop	Crop(s) that the SFT applies
Short Description		txt	Short in-game description that explains what the SFT does. Will be displayed in the shop.

Long Description		txt	Extended in-game description that explains the technology behind the SFT.
Info-Link		hyperlink	Link to GATES library with additional information about the SFT.
Soil Moisture		%	The amount of additional precision in determining the soil moisture
Soil Nutrition		%	The amount of additional precision in determining the required amount of fertilizer.
Crop Infection		%	The amount of additional precision in determining the crop inflection
Crop Ripeness		%	The amount of additional precision in determining the optimal time for harvesting
Weather Forecast		%	The additional precision in forecasting weather.
Yield Increase		%	Increase in yield by using the SFT compared to conventional farming.
Labour Reduction		%	Decrease in labour by using the SFT compared to conventional farming.
Fuel Consumption		%	Effect on fuel consumption from using the SFT compared to conventional farming.
GHG reduction		%	Reduction of GHG emissions from using the SFT compared to conventional farming.
Fertilization Efficiency		%	Increase in Fertilization Efficiency by using the SFT compared to conventional farming.
Seeding Efficiency		%	Increase in Seeding Efficiency by using the SFT compared to conventional farming.
Tillage Efficiency		%	Increase in Tillage Efficiency by using the SFT compared to conventional farming.
Irrigation Efficiency		%	Increase in Irrigation Efficiency by using the SFT compared to conventional farming.
Spraying Efficiency		%	Increase in Spraying Efficiency by using the SFT compared to conventional farming.
Harvesting Efficiency		%	Increase in Harvesting Efficiency by using the SFT compared to conventional farming.
Initial Price		€	Initial price that needs to be paid to acquire the SFT.
Yearly fee Payments		€/year	Yearly costs for using the SFT. Includes subscription fees for services, insurance, maintenance etc.
Training cost		€/day	Cost for training per day
Depreciation		years	Reduction of value over year

Task Cost Impact		€/Use	The financial impact on the task. Might be a positive value (increasing costs) or a negative value (reducing costs)
Scale		ha	Number of ha the SFT can operate on in a cropping season
Start Age		years	The age of SFT at the time it is purchased. (Used SFTs only)
Deterioration		formula	The reduction in efficiency by the SFT based on age.
Lifetime		years	The economic life of a machine
Complexity		%	Initial efficiency for using the SFT. Depends on how complex the SFT is and can be improved over time.
Requires SFT		tags	List of Tags associated with SFTs *one* of which is required to use this SFT.
Exclusive Effects with SFTs		tags	List of Tags associated with SFTs that don't have cumulative effects with this SFT.
Tags		tags	List of Tags associated with this SFT to be used for functional decencies with other SFTs.

Tabla 1: SFT Data information

The deliverable is 2.2 is a PDF file of approximately 3.43Mb and is stored in the projects private server in order to be accessible by the members of the consortium.

To conclude, the contents of this dataset is used internally from the consortium members to design and develop the game mechanics. All of the data is confidential and shared strictly only among the partners.

FAIR DATA

Making data findable, including provisions for metadata

This dataset is placed in the project private server and shared with the consortium members only. It is confidential because GATES is a commercial project and this dataset is part of the inner-process, thus, no procedures to make it publicly findable were of will be conducted. This dataset is accompanied with metadata, allowing the detection of outdated material. The metadata information will be:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
Resource type	The format of the dataset
Date	The date this dataset was collected

The consortium has decided on the following naming conventions per file:

- GATES – SFT Market.xlsx
- GATES – Modelling and simulation algorithms deliverable.pdf

Making data openly accessible

All of the data in this dataset is not openly available as they are confidential as part of the inner-processes of the project and only accessible through the members of the consortium. They are stored in a folder on the projects private server, which is shared only with the consortium partners to limit accessibility.

Making data interoperable
Not applicable. (Confidential Data)

Increase data re-use (through clarifying licenses)
Not applicable. (Confidential Data)

ALLOCATION OF RESOURCES
Not applicable. (Confidential Data)

DATA SECURITY
The data will be stored in the projects private server following its security and backup protocols.

ETHICAL ASPECTS
Not applicable. (Confidential Data)

OTHER
Not applicable. (Confidential Data)

Dataset No 5: Educational Content Data (Library Module)

Data Summary
The purpose of this dataset is the development and collection of the data that will be used to teach SFT skills in an effective way and provide more engagement for the trainees/learners. Specifically, this dataset along with the storyboarding (Task 3.2) will be the foundation of the Library Module of GATES, responsible of educating the players on the SFT and assist them on the objectives of the game.

To create this dataset, the SFT data collection (Dataset No 3) will be re-used and the following file formats will be produced:

- **Online PDF Documents**: Manuals of the SFT machinery, flyers, presentations and other education material that was collected and/or created which will be available in PDF format.
- **Videos**: Tutorials, instructions and other video material will be made available in .avi format to download. Videos will also be uploaded to the YouTube platform to view and share.
- **Images**: part of the educational content will be in the form of images that will be provided in the most used formats, JPEG, PNG, GIF.

At the moment this document is drafted, no file size estimation can be done. This dataset will be extremely useful to the players of the game and to researchers that require access to the current SFT technologies.

FAIR DATA

Making data findable, including provisions for metadata
This dataset will be hosted both on the projects private server and in the web portal server for it to be openly accessible. Each dataset will be accompanied by the following metadata to ensure its quality:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
File type	The format of the dataset (pdf, pptx etc.)
File Size	The size of the dataset
Version	The version number of the dataset
Date	The date this dataset was created

Info	Information of the dataset in case any clarification is necessary.

In the web portal, the visitors will be able to locate these data either by following the menu hierarchy, or by using the search bar and querying the name of the dataset as keyword. A general naming convention has been decided by the consortium at this point, where the files will use the following format GATES-{File Title as in metadata}.{Version as in metadata}.{file type extension} (i.e GATES-Sprayer Configuration.01.pdf). This convention will be re-evaluated in the lifespan of the project for its clarity on information delivery.

Making data openly accessible

All content of this dataset will be openly accessible via the GATES web portal without any restrictions on the access. To access them the users will need to navigate to the GATES website, locate the desired file and open it using one of the following tools, based on the file type:

- **Adobe Acrobat Reader** for the .pdf files
- **Microsoft PowerPoint** for the presentations
- **VLC media player** for the videos
- **Windows Photos** for the images

The web-portal can be accessed by the visitors through the browser of his choice (Firefox, Chrome, Microsoft Edge etc.) and by navigating to http://www.gates-game.eu/. Through the browser, additional content will be made available to the user in the form of articles on a wiki page.

Making data interoperable

This dataset will be educational content to be used “as is” for reference and educational material. In extend no interoperable operations are to be made.

Increase data re-use (through clarifying licenses)

The specific license under which the files of this dataset will be hosted is under investigation by the consortium. The partners have decided that this dataset will be open for everyone to view and download as an educational content but with no right to reproduce it, as a set of this data will be provided to GATES by third parties with their own license and specific permissions will be required.

ALLOCATION OF RESOURCES

Not applicable (Covered by the person months of WP 3).

DATA SECURITY

Since the data are openly available in the web portal no extra security measurements are needed. A backup of this dataset will be stored in the projects private server to ensure data recovery in case of data loss.

ETHICAL ASPECTS

Not applicable.

OTHER

Not applicable.

Dataset No 6: Game Backend Data (Logger Module)

Data Summary

The purpose of this dataset is to track player behavior and get all insights the consortium needs to improve the game in the framework of the validated learning process (WP5). Several data will be recorded such as individual

player performance, reactions and results from the players and rating of the tasks by the users to increase quality and performance.

No existing data were re-used for the collection of this dataset.

The data on this collection can be divided into two distinct categories: i) the validation cycle results and ii) the game play behavior data.

The first is the results of the questionnaire that was answered by the test players during the first validation cycle and resulted in an excel file "*GATES - First validation cycle-results-survey189595.xlsx*" approximately 28Kb of size that contains 85 responses from the players.

The second dataset is a collection of information on the behavior of the players during the game that was recorded automatically by the *Unity* engine and provides the consortium with the following information:

Data type	Data description
Operating system	The type of operating system under which the players accessed the game (Windows, Linux, MacOS)
Browser	The browser used to start the game (Firefox, Chrome, Opera etc)
End State	The result of the game (Won or Lost)
User ID	The ID of the current player
Scenario Spending	The expenditures of the player during the game play
Scenario Income	The money the players earned during the game play
Scenario ID	The ID of the scenario that was played

The game behavior data are stored in files per month and each file size can vary from 1Kb to much higher according to the number of scenarios that are recorded.

Both datasets will be extremely useful to the consortium as a valuable feedback on the user experience and the effectiveness of the tasks of the game.

FAIR DATA

Making data findable, including provisions for metadata

The data on this dataset is confidential and with restriction on the access only by the members of the consortium.

Making data openly accessible

Not applicable (Confidential data)

Making data interoperable

Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)

Not applicable (Confidential data)

ALLOCATION OF RESOURCES

Not applicable (Confidential data)

DATA SECURITY

All of the data will be hosted in the projects private server for safekeeping. Periodical backup mechanisms will be established to ensure data recovery.

ETHICAL ASPECTS
Not applicable (Confidential data)

OTHER
Not applicable (Confidential data)

Dataset No 7: GATES Game Data

Data Summary
The purpose of this dataset is to collect the data needed for the development of the game core, such as graphics, animations, gameplay, interface, audio etc. The origin of this data will be personal work from the members of the consortium so no data re-use is available.
The data will be in numerous formats, based on its type. For example,

- **3-D modelling data** will be in Blender format (.fbx)
- **Animations data** in Maya format(.ANIM)
- **Educational material and the info tips** will be in the form of text database records.
- **Images** in .jpeg and .svg vector files

The expected file size cannot be yet accurately estimated but it is expected to be in the Gigabyte scale. It will be saved in the projects private server and accessed by the consortium members only. This dataset is extremely valuable to the developers of the game and to the members of the consortium in general.

FAIR DATA

Making data findable, including provisions for metadata
The content of this dataset will be hosted in the private server of the project and restricted to the consortium members only. Moreover, it will be accompanied by the following metadata table to ensure its quality and allow the partners to locate the desired version:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
File type	The format of the dataset (.fbx, .annim, etc)
File Size	The size of the dataset
Version	The version number of the dataset
Date	The date this dataset was created
Info	Information of the dataset in case any clarification is necessary.

Making data openly accessible
Not applicable (Confidential data)

Making data interoperable
Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)
Not applicable (Confidential data)

ALLOCATION OF RESOURCES
No additional cost is required for this dataset as it is included in the person months cost of WP4.

DATA SECURITY
All of the data will be hosted in the projects private server for safekeeping. Periodical backup mechanisms will be established to ensure data recovery.

ETHICAL ASPECTS
Not applicable (Confidential data)

OTHER
Not applicable (Confidential data)

Dataset No 8: Meteorological Data (Data module)

Data Summary
The purpose of this dataset is to provide GATES with historical meteorological data (temperature, humidity, precipitation etc.) from all over Europe for the simulation of the agricultural conditions. These data are vital for the algorithms to work as expected. The source of this dataset is online weather services, which were queried by EU-climate zone, and the results stored in the projects private server.

For the purposes of this dataset, excel file formats were created, containing the response of the web services regarding the weather conditions of each climate zone for the last 16 years. No existing data was re-used and the total storage size for all of the created files is 4.71Mb and is expected to increase to maintain the previous information (history). This dataset is vital for the development of the simulation part of the game. The following table shows the data types/information that is stored in each file:

Title	Unit
Day	Date
Average Temperature	°C
Maximum temperature	°C
Minimum temperature	°C
Atmospheric pressure at sea level	hPa
Average relative humidity	%
Total rainfall and / or snowmelt	mm
Average visibility	Km
Average wind speed	Km/h
Maximum sustained wind speed	Km/h
Maximum speed of wind	Km/h
Indica whether there was rain or drizzle	the total days it rained
Indica if it snowed	the total days it snowed
Indicates whether there storm	Total days with thunderstorm
Indicates whether there was fog	Total days with fog

FAIR DATA

Making data findable, including provisions for metadata

This dataset is restricted and accessible only among the members of the consortium. It is stored in the projects private folder and can be accessed using the Excel software. Particularly, this dataset consists of 18 excel files, one for each supported area. The naming convention used is {area}_{Date From: YYYY}-{Date To: YYYY}.csv, i.e. Athens_2000-2016.csv.

This dataset is accompanied by metadata information to assure the quality of the service. The metadata include the following information:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
File type	The format of the dataset (.xml, .json)
File Size	The size of the dataset
Climate zone	An identifier of the climate zone these data represent
Date period	The date range the data correspond to
Original Source	The web service provider of the data
Info	Information of the dataset in case any clarification is necessary.

No versioning provisions are to be made since the data relates to a specific time period and will not change in the future.

Making data openly accessible

Not applicable (Confidential data)

Making data interoperable

Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)

Not applicable (Confidential data)

ALLOCATION OF RESOURCES

No additional cost is required for this dataset as it is included in the person months cost of WP4.

DATA SECURITY

All of the data is hosted in the projects private server for safekeeping. Periodical backup mechanisms are established to ensure data recovery.

ETHICAL ASPECTS

Not applicable (Confidential data)

OTHER

Not applicable (Confidential data)

Dataset No 9: Agricultural Data (Data module)

Data Summary

The purpose of this dataset is to provide GATES with historical agricultural data from all over Europe for the simulation of the agricultural conditions. The data will be classified according to the European climate zones and will provide information regarding soil, yield and pest infestation. The source of the soil data will come from online databases, where, for yield and pest infestation data, a research will be conducted by the consortium.

For the purposes of this dataset, XML (eXtensible Markup Language) and JSON (JavaScript Object Notaion) file formats will be created, which will contain the collected information (yield, soil, pest infestation) per zone, per time period. No existing data can be re-used and the total expected size cannot be estimated since it will constantly increase to maintain the previous information (history). This dataset will be vital for the development of the agricultural conditions simulation part of the game.

FAIR DATA

Making data findable, including provisions for metadata

This dataset will be restricted and accessible only between the members of the consortium. The interested partners will be able to interact and retrieve data using a custom API and the appropriate credentials. The API will respond the data that match the query parameters (time, location) in the selected format (XML, JSON). The consortium has decided on a general naming convention of the response files in the following pattern GATES-{Climate zone}.{Data type}.{Date From: ddmmYYY}.{Date To: ddmmYYY }.{file extension}, i.e. GATES – Mediteranean.Soil.16032017.19032017.xml

The data response will be accompanied by metadata information to assure the quality of the service. The metadata will include the following information:

Creator	The consortium partner responsible of the creation
Title	The label of this dataset
File type	The format of the dataset (.xml, .json)
File Size	The size of the dataset
Climate zone	An identifier of the climate zone these data represent
Data Type	Soil or Yield or Pest Infestation
Date period	The date range the data correspond to
Info	Information of the dataset in case any clarification is necessary.

No versioning provisions are to be made since the data will relate a specific time period and will not change in the future.

Making data openly accessible

Not applicable (Confidential data)

Making data interoperable

Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)

Not applicable (Confidential data)

ALLOCATION OF RESOURCES

No additional cost is required for this dataset as it is included in the person months cost of WP4.

DATA SECURITY
All of the data will be hosted in the projects private server for safekeeping. Periodical backup mechanisms will be established to ensure data recovery.

ETHICAL ASPECTS
Not applicable (Confidential data)

OTHER
Not applicable (Confidential data)

Dataset No 10: GATES experiments data

Data Summary
In the lifespan of the GATES project, three game experiments will be conducted in three pilot countries. The data collected during these experiments will be the content of this dataset. Its purpose will be to validate the game version at hand and to prove that a) players enjoy the core gameplay of the specific version and b) that players can understand the game mechanics.

No existing data will be reused and the new data that will be collected, will come from the players that will provide feedback on their gaming experience during the experiment. The format of the data isn't decided at this point and will be later on, as the experiments will be designed. This particular dataset will be extremely useful to the game development partner and in the consortium in general as to validate the game in terms of achieving the desired goals with a live audience.

FAIR DATA
Making data findable, including provisions for metadata
This dataset is part of the inner-validation process of the GATES game and will be restricted and accessible only by the members of the consortium. It will be stored in the projects private server which is accessible by all the member of the consortium.

There is no need for versioning control as it is not possible to change after the collection and no need for metadata as well. Additionally, the naming convention of the files will be decided during the experiments design process, where the file formats will be decided as well.

Making data openly accessible
Not applicable (Confidential data)

Making data interoperable
Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)
Not applicable (Confidential data)

ALLOCATION OF RESOURCES
No additional cost is required for this dataset as it is included in the person months cost of WP4.

DATA SECURITY
All of the data will be hosted in the projects private server for safekeeping. Periodical backup mechanisms will be established to ensure data recovery.

ETHICAL ASPECTS
Not applicable (Confidential data)

OTHER
Not applicable (Confidential data)

Dataset No 11: GATES market data

Data Summary
The purpose of this dataset is to assist the consortium to better identify the countries in which market entry will be more straightforward, leading to a selection of 5 target countries, whose markets will be addressed in the business plan. The source of this dataset is the work performed by the partner "INI", which conducted a market research focusing in 10 EU countries including the most mature SFT markets of Northern Europe.

Several market criteria were processed and analyzed including (among many others):

- Distribution of territory by type of region
- GDP per capita by type of region. Eurostat 2013
- Agricultural land use in EU countries
- Agriculture factor income and Gross Fixed capital
- Production of cereals in EU-28
- Production of fruit and vegetables in the targeted countries
- Production of grapes in the EU-28
- Farm Economic, Physical and Labour size for the EU-28
- Regular farm labor force, in persons
- Demographic statistics for Farm managers by age
- Farm training statistics
- Farmer gender statistics
- Internet Access statistics
- SFT acceptance rate in EU
- Business model for Serious Game
- Market acceptance research
- Game-based learning growth rates
- Game-based learning by Region, Country and Educational Game Type
- Research on available serious games in agriculture (direct competitor analysis)
- Age gap in farmers (ratio of young to old farmers)
- Knowledge needs of young farmers
- Potential stakeholder analysis
- Farmer association analysis in the EU

All of the information that was collected and thoroughly analyzed by INI is well documented in the 6.6 deliverable which has been submitted to the SyGMa platform. This dataset will be very useful to the consortium to design the optimum path to reach the users.

FAIR DATA
Making data findable, including provisions for metadata
This dataset is collected from open sources but the analyzation is considered confidential as part of the commercial project that GATES is. In extend, this dataset is confidential and restricted to the members of the consortium only.

Making data openly accessible
Not applicable (Confidential data)

Making data interoperable
Not applicable (Confidential data)

Increase data re-use (through clarifying licenses)
Not applicable (Confidential data)

ALLOCATION OF RESOURCES
No additional cost is required for this dataset as it is included in the person months cost of WP4.

DATA SECURITY
All of the data is be hosted in the projects private server for safekeeping. Periodical backup mechanisms will be established to ensure data recovery.

ETHICAL ASPECTS
Not applicable (Confidential data)

OTHER
Not applicable (Confidential data)

Support Package

The support package includes a list of recommendations that should be applied for the project in general and specifically for each partner, according to its role into the consortium.

General GATES recommendations

- To prepare the Data Management Plan within the first six months of the project and update the report during the lifetime of the project when significant changes will happen (e.g. new data types to be included, changes in the consortium).
- To deposit the project's scientific publications to Open Access Journal repository, partners' institutional repository, GATES platform and/or OpenAIRE's zenodo repository.
- Project partners to add the appropriate acknowledgement text to the scientific publications, related to GATES outcomes.
- Project partners to use the public Creative Commons open access licensing schema (e.g. CC BY 4.0) where applicable.
- To set up the workflow process for uploading and publishing content into the GATES platform.
- To set up the quality assurance process for publishing the GATES platform content.
- To define the information schema for the GATES platform content.

Recommendations for AUA partner (GATES coordinator)

- To prepare the Data Management Plan within the first six months of the project and update the report during the lifetime of the project when significant changes will be happened (e.g. new data types to be included, changes in the consortium).

- To be responsible for the overall day-to-day financial and administrative management and coordination of the project.
- To act as a liaison between the Consortium and the European Commission; prepare and ensure the timely delivery of all required reports, deliverables, and financial statements to the European Commission.
- To deposit the AUA's publications and associated metadata related to GATES outcomes into Open Access Journal repository or institutional repository (where applicable).
- To guide project partners to add the appropriate acknowledgement text to the scientific publications, related to GATES outcomes. This information should be included into specific publication section, as well into the metadata fields.
- To encourage project partners to use the open access licensing schema (CC BY 4.0) for the publications and reports related to GATES outcomes (if there are no restrictions).
- To upload the information related to smart farming technologies into the GATES platform with a link directly to the original source.
- As an alternative, the project publications could be stored into the OpenAIRE giving the ability to third parties to access, mine, exploit, reproduce and disseminate them.
- To create a library about SFT and serve it to the consortium member to be used both in-game and in the web portal as informational material.
- To upload descriptions of the AUA's publications for smart farming technologies, as new records into the GATES platform with link to the original source (open access journal repository and/or institutional repository).
- To decide about the validation process for ensuring the high quality of the GATES platform content, e.g. the partners' role, quality assurance criteria for the uploaded content, which uploaded content will be published etc.
- To coordinate the licensing schema that should be applied for the GATES platform content. Most preferred licensing schema is the Creative Commons CC-BY 4.0 that prohibit the system users to re-use and modify the SFTs information without the previous attribution to the source.
- To prepare the support package for project partners with guidelines on how to generate, collect and disseminate the project content.
- With explicit agreement by the Commission, other open access costs related to membership to a journal for publishing in open access or as a pre-condition for lower article processing charges could be explored (Project Officer could assist on that).
- To distribute the questionnaire to 100 students in the Agricultural University of Athens and provide the feedback to the consortium.
- To collect data from scientific publications related to smart farming technologies.
- To be responsible for the agenda and minutes of the meetings and to organize telephone or video conferences.
- To be responsible for the decisions regarding the strategic orientation of the project (strategy, progress, major project revisions, collaboration with other projects, dissemination, etc).
- To prepare and deliver the Consortium Agreement (prior to Grant Agreement).
- To set up a working protocol for the project partners to ensure smooth communication throughout the duration of the project.
- To set up a web-based tool (intranet in project's platform) to facilitate internal communication on project activities and the safe exchange of documents.
- To implement financial sheets to facilitate the financial reporting and monitoring of the project
- To transfer the EU Financial Contribution received to the participants according to the budget agreed with the Project Officer and within the timeframe.
- To organize the periodic consortium meetings with the support of the hosting partner.

- To prepare the agendas and meetings of the General Assembly and ensure that decisions are made and properly implemented.
- To ensure that each WP is implemented according to the tasks and time schedule stated in the Grant Agreement and that results fit the stated objectives.
- To ensure frequent interactions with the WP leaders (through the MST) and the General Assembly.
- To ensure the overall integration of all WP activities.
- To promote gender equality within the project.
- To define the learning methodology of GATES.
- To create the algorithms and models for the mechanics of the game.
- To contribute on the GAME design development by creating the Storyboarding of GATES.
- To cooperate with INO on the user requirements and competencies.
- To cooperate with INO on setting up the game experiments.
- To cooperate with INO on applying lean game development.
- To cooperate with INO on running the experiments and the evaluation of the results.
- To cooperate with INI on creating the dissemination and communication plan.
- To cooperate with INI on the identification of the market and the creation of the business model.
- To cooperate with MP on game design and interfaces definition.

Recommendations for InoSens partner

- To deposit the InoSens's publications and associated metadata related to GATES outcomes into Open Access Journal repository or institutional repository (when applicable based on restriction policy).
- To design the questionnaire for the user requirements, distribute it between the partners and educate them.
- To distribute the questionnaire to 100 farmers in Serbia to fill and provide the feedback to the consortium.
- To provide to the partners the overall methodology for the validation process of GATES.
- To provide the consolidated recommendation reports coming up from each of the three iterations of the validation process on Serbia, Spain and Greece.
- To assist on the game design process, ensuring that educational contents and game interplay and modes fit the user requirements and game design agree.
- To setup the game experiments in the three pilot countries and run them in cooperation with the corresponding partners.
- To cooperate with AUA on the Material collection, classification and evaluation process.
- To cooperate with AUA on the learning methodology definition.
- To cooperate with MP on the development of the game backend and the minimum viable game (MVG) versions and the extended features.

Recommendations for MP partner

- To propose the overall game design and interfaces and upload them into the private server.
- To support INO partner on the design of storyboard of the general game and each different modules.
- To develop and share with the partners the GATES minimum viable game (MVG).
- To develop and share with the partners the GATES Android and iOS versions of the game.
- To perform live tests of the game when it reaches its final state.
- To provide post-production and balancing, bugfixing, polishing and further improvements of the game.
- To develop a 3D environment that will simulate training with the realistic interfaces of the SFT.
- To construct the scenario creation mechanism that will allow users to customize their training experience.
- To develop the Statistics Module, which will project complex information in a easy to comprehend manner.

- To provide social features for players interaction through social platforms (i.e. Facebook, Linkedin).
- To cooperate with INO partner on setting up the game experiments.
- To cooperate with INO partner on applying lean game development.
- To cooperate with INI partner on creating the dissemination and communication plan.
- To cooperate with INI partner on the identification of the market and the creation of the business model.

Recommendations for Iniciativas Innovadoras partner (INI)

- To deposit the INI's publications and associated metadata related to GATES outcomes into Open Access Journal repository or institutional repository (when applicable based on restriction policy).
- To distribute the questionnaire for the user requirements to agricultural audience (farmers, agronomists) and provide the consortium with the results.
- To create and upload the Dissemination & Exploitation Strategy & Plan to the web-portal and the projects private server.
- To create and upload the Dissemination & Exploitation Reports to the web-portal and the projects private server.
- To create and upload the dissemination material to the web-portal and the projects private server.
- To create and manage the GATES User Group Community.
- To collaborate with the coordinator (AUA) on organizing the final dissemination event in Greece.
- To document and upload the public deliverables of WP6 (Communication, Dissemination & Exploitation) to the web portal.
- To develop the business plan of GATES and present it to the partners.
- To provide partners with the dissemination material they will use to promote GATES.
- To conduct a market research and present the results to the members of the consortium.

Recommendations for ANSEMAT partner

- To deposit the ANSEMAT's publications and associated metadata related to GATES outcomes into Open Access Journal repository or institutional repository (when applicable based on restriction policy).
- To distribute the questionnaire for the user requirements 20 company representatives and 20 SFT specialists and provide the consortium with the results.
- To assist on the GAME design development in creation of GATES Storyboarding.
- To assist on the creation of a library about SFT and serve it to the consortium members to be used both in-game and in the web portal as informational material.
- To disseminate the project in events and meetings, mostly in the SFT and PA fields.
- To create a target group of technical experts from its member associates to provide feedback to the developers on the required elements of the game.

Applying GAming TEchnologies
for training professionals in Smart Farming

GATES
SMART FARMING SIMULATION PLATFORM

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PARTNERS IN GATES

INOSENS | ANSEMAT | in iniciativas innovadoras | ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ AGRICULTURAL UNIVERSITY OF ATHENS | Mad about Pandas meaningful games