

SHORT TERM SCIENTIFIC MISSION (STSM)

Scientific Report

**A gamified- and citizen science-based approach for the exploration of the
historical German language in the Austrian context**

by Antonio Gabriel Losada Gómez

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STSM Title:	A gamified- and citizen science-based approach for the exploration of the historical German language in the Austrian context
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Host	Eveline Wandl-Vogt
Host Institution:	Austrian Academy of Sciences. Austrian Centre for Digital Humanities, Vienna (Austria)

Brief Summary

RESEARCH INTEREST:

The main topic of the research was the application of citizen science approaches to the digital humanities field, bringing the yet unknown knowledge and insights from both volunteers and experts to the project we're working at and forming a community of people working together towards improving the communal outcomes of it.

SUMMARY OF RESEARCH COMPLETED IN STSM:

To sum up everything achieved during my stance in Vienna and the duration of the STSM, a list of the most important milestones reached during the two weeks is presented next:

- Multiple potential working groups of citizen scientists and volunteers were discovered and defined. Those groups are supposed to help us achieve the best possible results in terms of solving research questions. To do this, they will be contacted and participate in meetings and workshops.
- Two approaches were defined as to how to deal with the. The first one would focus on organizing meetings in which we would give participants concrete research questions we want them to help us answer. In the second one the volunteers would be the ones leading the discussion and coming with their interests.
- An open and adaptive development process was described, in which can be considered one of the main achievements of the STSM. With it, we will be able to tackle any project no matter its scope, the background of the citizen scientists and groups of volunteers involved, or the actual expected outcome.
- Gamification and gaming-based methods will be applied to the prototypes created next and as the result of the work carried out during the STSM, which will fit the purpose of our team's project in that they will help us find new insights and discover knowledge about diverse cultural topics.
- A template for result generation was also defined to the finer level of detail, consisting on multiple steps: defining a set of research questions to solve, specifying collaboration groups, organizing workshops, analysing workshop outcomes, developing prototypes and writing scientific papers, applying feedback to the prototypes to evolve them, reaching results and disseminating them.
- Although no workshops were held during the STMS due to the lack of participating groups to work with, a meeting with game-developer Jeremiah Diephuis was organized and took place at Linz. We could get instant feedback from a person tightly related with the gamification approach we want to take next.
- Two concrete tools are expected to be built as the result of the STSM. One, related to the creation of an online gamified system that would allow us to get feedback and insights about the relation between cultural aspects and the topic of food. The other, related to the building of a recipe-based system in which users would be able to explore the topic of "food".

SYNTHESIS AND APPLICATION:

The STSM helped our project benefit from the use of citizen science by using volunteers to curate data and improve it, all of it using systems and tools in engaging ways and helping closing the gap between the team of experts working in the project and the untrained volunteers collaborating with us, who provided new information unknown to date and that will ultimately improve the quality of the results and prove how citizen science can be very important in the context of science and innovation.



WIDER BENEFIT OF THE STSM TO THE PARTICIPANT:

The STSM was a great achievement for me given that I could collaborate and work in-place with the team of experts based on Austria, which provided me with a detailed view of how they approach their work and the methods they use. This is very important in a multi-background project such as ExploreAT!, in which teams from different parts of Europe are collaborating, each with a different expertise.

The possibility to stay at the Academy of Sciences, working along many experts, has been key to further develop my cognition and interpretation of the work related to the dictionary assembly and curation processes, as well as the parallel work related to them. I was also able to understand the reasoning of the lexicographers better in terms of which topics and research questions interest them the most, the groups they have contacted as potential collaborators for our citizen science approach, and the people surrounding the Academy that could be of potential help.

Finally, the fact that the STSM plans needed to be changed during its completion also made it incredible valuable for me, as I had to adapt to the situation and tightly collaborate with the people in Vienna.

KEY OUTPUTS / THE MAIN RESULTS OBTAINED:

The following list highlights the most important milestones achieved during the STSM in Vienna:

- Multiple potential working groups of citizen scientists and volunteers were discovered and defined. They are supposed to help us achieve the best possible results in terms of solving research questions. They will be contacted and participate in meetings and workshops that are expected to yield results that will be used to improve our data-gathering tools and gamified prototypes to get information from the users.
- Two approaches were defined as to how to deal with the citizen workshops. The first one would focus on organizing meetings in which we would give participants concrete research questions we want them to help us answer. The second one could be seen as an “open talk” approach in which the volunteers would be the ones leading the discussion and coming with their true interests.
- An open and adaptive development process was described. With it, we will be able to tackle any project no matter its scope, the background of the citizen scientists and groups of volunteers involved, or the actual expected outcome. Every project will have in common that they will be related to the relation between cultural concepts and the topic of “food”.
- Gamification and gaming-based methods will be applied to the prototypes created next and as the result of the work carried out during the STSM, which will fit the purpose of our team’s project in that they will help us find new insights and discover knowledge about diverse cultural topics.
- A template for result generation was also defined to the finer level of detail, consisting on multiple steps: defining a set of research questions to solve, specifying collaboration groups, organizing workshops, analysing workshop outcomes, developing prototypes and writing scientific papers, applying feedback to the prototypes to evolve them, reaching results and disseminating them.
- A meeting with game-developer Jeremiah Diephius was organized and took place at Linz. Our team could get instant feedback from a person tightly related with the gamification approach we want to take next, and multiple potential game ideas were discussed and kept for future work.
- The visit to Linz allowed to explore the Ars Electronica building and the Deep Space room. This helped me generate an image of what could be accomplished by developing games that exploit that space and its capabilities, and it also fostered the imagination of team members in terms of potential game scenarios and ideas related to them.

STSM Report

PURPOSE OF THE STSM

As a PhD Candidate, to be accepted for the completion of this STSM comprised a great chance for me to work along a team of experts, mostly lexicographers, at the Academy of Sciences in Vienna (Austria). This group of people has been working with the team present in Spain of which I'm part of, its focus and background being that of computer science and data visualization. Together, along a third group based on Dublin (Ireland), we form the working structure of the ExploreAT! project that served as the building block of the work carried out during the completion of the STSM.

The ExploreAT! project is pointed toward the exploration of big corpus coming from Bavarian historical dictionaries. As an active part of the development team based in Spain, I have taken care of building some prototypes helped by the directions and insight provided by the Austrian team of lexicographers, given their background and knowledge of the data we have been using.

At this point in the project, and as it has been common practice during the first two years of its development, we're trying to bring together teams of experts with different backgrounds and the next natural step was to also include citizen science into our developmental process, thus creating a connection with people from outside the project. The involvement of those people (untrained experts and volunteers) will help us improve the project's results. They will help to improve our data and curate it, and they will also provide insights and knowledge that we may not have expected or were not aware of. To do this, we are taking a development approach based on the creation of gamified prototypes and the use of game-based mechanics in our tools, which were expected to be discussed during the STSM.

The main points to cover during the STSM, therefore, were the following ones:

- Get to **work with the team of lexicographers and citizen science experts based in Austria**, to know more about their approach to our work, their knowledge of the data, to get insights from there and build a solid schedule of work for the following months.
- **Extract needs from both the team of experts and potential citizens or volunteers** in terms of what they would expect from future tools to achieve in relation with the handling of our datasets.
- **Trying to organize meetings with volunteers or external sources** that could provide knowledge to be used during the development of the new gamified prototypes and tools.
- **Build a comprehensive schedule of tasks to complete** in the frame of the ExploreAT! project during the upcoming months, outlining potential scenarios and defining groups of external agents to work with.
- **Eventually, publish the results of the STSM** in the shape of papers and scientific reports once results are achieved based on the work been done in Vienna and back in Salamanca.

DESCRIPTION OF THE WORK CARRIED OUT DURING THE STSM

To get the most out of the STSM, a schedule of tasks to complete was created prior to it been granted, and the work was carried out in sessions:

1. Potential working groups and first gamification ideas

We **outlined some potential working groups of volunteers**. The background of the work to be done is that of **cultural connections between our dataset and the topic of "food"**. We planned on focus on outlining a more **detailed development plan of new tools and gamified prototypes during the STSM**, and also got in contact with a game development expert (Jeremiah Diephius) that would meet us.

2. Planning workshops and the STSM-related work to be carried out

We outlined **two approaches to follow**. 1) With a focus on **organizing meetings to introduce our team and give participants information about what we are after**; 2) focused on an **"open talk" approach in which the participants would be the ones generating topics of their interest**.

3. Defining a comprehensive development process

We **defined a process to follow to build a guided step-by-step line of work** for the future. It comprised defining a research question, designing our research methods, preparing and collecting the needed data, analysing and interpreting the results of our process, and finally publicising them. We made this **process adaptable to all the possible approaches** we may take, so we could reuse it.

4. Detailing scenarios that fit our development process

We focused on **detailing the development process steps regarding the approach in which we would try and find associations and links between cultural concepts and the topic of "food"**. We would first propose a research question to the citizens and then we would try to solve it given their feedback.

5. Setting up an adaptable schedule of tasks to follow for each of our development processes in order to generate results

We moved on to **create a template for results generation**. The aim was to have something **"generic and adaptable"** in terms of structure that could be used to cover different cultural topics and their relation with our research questions. For this, we specified an ordered set of tasks to follow:

- 1) Define a set of research questions to solve
- 2) Specify collaboration groups
- 3) Organise workshops
- 4) Analyse the outcome of the workshops and meetings
- 5) Development of prototypes and writing of papers
- 6) Test of prototypes and feedback acquisition
- 7) Reach results and disseminate them

6. Meeting with Jeremiah Diephius and Deep Space/ARS Electronica visit

We **arranged a meeting with Jeremiah Diephius** at ARS Electronica (in Linz) to get his feedback on our approach to gamification and serious games development. We also **visited Deep Space**, where we would like to showcase results. We **outlined four potential scenarios that could be exploited there**: **"fun" games**, **"serious" games**, **"proxy" games** and **"fancy looking" prototypes**.

7. Closing meetings and scheduling of potential scenarios and results

We **defined some potential scenarios to be explored during the coming weeks as part of our project's work**. These are included in the next section of the report.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The following list highlights the most important milestones achieved during the STSM in Vienna:

- Multiple potential working groups of citizen scientists and volunteers were discovered and defined. They are supposed to help us achieve the best possible results in terms of solving research questions. They will be contacted and participate in meetings and workshops that are expected to yield results that will be used to improve our data-gathering tools and gamified prototypes to get information from the users.
- Two approaches were defined as to how to deal with the citizen workshops. The first one would focus on organizing meetings in which we would give participants concrete research questions we want them to help us answer. The second one could be seen as an “open talk” approach in which the volunteers would be the ones leading the discussion and coming with their true interests.
- An open and adaptive development process was described. With it, we will be able to tackle any project no matter its scope, the background of the citizen scientists and groups of volunteers involved, or the actual expected outcome. Every project will have in common that they will be related to the relation between cultural concepts and the topic of “food”.
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- The visit to Linz allowed to explore the Ars Electronica building and the Deep Space room. This helped me generate an image of what could be accomplished by developing games that exploit that space and its capabilities, and it also fostered the imagination of team members in terms of potential game scenarios and ideas related to them.

Two concrete tools are expected to be built as the result of the STSM work been done in Vienna. One is related to the creation of an online gamified system that would allow us to get feedback and insights about the relation between cultural aspects and the topic of food. The other one is related to the building of a recipe-based system in which users would be able to explore the topic of “food” in a more serious way.

FUTURE COLLABORATIONS

The STSM was a great achievement for me given that I could for the first time collaborate and work in-place with the team of experts based on Austria, which provided me with a detailed view of how they approach their work and the methods they use. This is very important in a multi-background project such as ExploreAT!, in which teams from different parts of Europe are collaborating, each with a different expertise.

The possibility to stay at the Academy of Sciences, working along many experts, has been key to further develop my cognition and interpretation of the work related to the dictionary assembly and curation processes, as well as the parallel work related to them. I was also able to understand the reasoning of the lexicographers better in terms of which topics and research questions interest them the most, the groups they have contacted as potential collaborators for our citizen science approach, and the people surrounding the Academy that could be of potential help such as Jeremiah Diephuis, who I had the chance of meeting on Linz during my stay in Austria.

Finally, the fact that the STSM plans needed to be changed during its completion also made it incredible valuable for me, as I had to adapt to the situation and tightly collaborate with the people in Vienna in order to make the most out of it, restructuring it and coming with the best possible result at its end.

As the future work to be completed next, and as stated at the end of the prior point, we set a couple of little projects to tackle with different approaches to follow. The first one, related to the creation of an online gamified system, would rely on engaging mechanisms that allow the users (or players) to have a good time using our prototype while giving us insights and providing knowledge without realizing it. The main aim of this system would be to recover underlying data that users would probably not recognize as they are contributing while they indeed are just by playing the game. The second one would be related to the use of a recipe API with which we would try to work and build a prototype that allow to explore the topic of "food" in simple yet powerful ways. This is the path we have followed during the development of prior prototypes and therefore it would probably end being more scientific- than citizen-driven, in that it would be more focused on applying data mining and visualization methods to a topic rather than building a game around it. At least one of those tools is expected to be done by the end of January 2018 as a potential result of the STSM.