GiantSteps

Seven League Boots for Music Creation and Performance

FP7-610591

D2.1

Report on Qualitative and Quantitative Methodological Frameworks

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Abstract

This report outlines the methodological framework for the user involvement in the GiantSteps project. Focussing on Participatory Design and Qualitative User Testing, we describe the theoretical background and how this expresses itself in our strategies involving users in the imagination, design and exploration of new options and potential solutions to

working creatively with music. The document goes on to specify a number of methods and formats for participation as well as plans for events, structure and documentation standards. The document will be revisited and updated in D2.3, which updates the methodological framework described in D2.1 and extends it with a collection of criteria for the evaluation of prototypes.

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Executive Summary

This report outlines the methodological framework for the user involvement in the GiantSteps project. Focussing on Participatory Design and Qualitative User Testing, we describe the theoretical background and how this expresses itself in our strategies involving users in the imagination, design and exploration of new options and potential solutions to working creatively with music.

This will allow us to take advantage of the consortium's strengths, and bring new technologies from academic and industrial research to the user groups that will ultimately use these tools. To this end, the project incorporates a cyclical structural design to maintain strong cooperation with music and sound practitioners.

The user-centred development process happens on two levels: On one hand, we will establish groups of expert-users who will follow the process for the duration of the project as well as hosting shorter workshop-like experiences. These are designed to explore a particular issue or development, or test the findings from our expert-user group against groups of other types of users. On the other hand, we will expose the achievements made to large groups of developing and expert users at the Red Bull Music Academy and at Music Hack Days. The longitudinal aspect of some of the user groups is intended to allow users to have continuous and sustained input to the design and development process as the project progresses.

The underlying concern for this process is to not just improve on existing user interfaces for electronic music; but rather aim for interface structures that might fit better with our associated musicians' mental images of the music that they make. As such, we will not be measuring potential increases in efficiency in a quantitative way, but rather we will aim for providing increased flow and unbroken periods of concentration and creativity. To this end, we will be following the current research standards of collaborative and participatory design processes, as well as more traditional qualitative user involvement methodologies.

The purpose of this document is to create a shared set of methodologies and criteria to execute and evaluate user involvement within the project. It is envisioned as a guide as to how the consortium approaches user participation, and contains as much detail as possible on the consortiums intentions for the different types of user involvement.

This document should be used as a guide to direct researchers and designers as they proceed within the project through user participation, but in an equally important way, this document serves to facilitate an on-going cross-consortium conversation as to how and to what purpose the user involving aspects of the project are conducted.

Table of Contents

List of Figures

1 Introduction

The GiantSteps project is a collaboration between music research institutions (Universitat Pompeu Fabra Barcelona, ES, Johannes Kepler Universität Linz, AT), manufacturers of software and hardware for music production and performance and R&D companies (Native Instruments, Berlin, DE, Reactable, Barcelona, ES, JCP-Consult, Paris, FR), and music practitioners (STEIM, Amsterdam, NL, Red Bull Music Academy, Cologne, DE) funded by the European Union through the 7th Framework.

The GiantSteps project aims to create musical tools that provide intuitive and meaningful interfaces to complex selections of sounds and musical data though expert agents, music analysis algorithms and new interface paradigms. The project consortium will employ participatory design processes to not only develop and test requirements for interfaces to new instruments, but also to gain a better understanding of how musicians "see" their music, how its information can be conceptualised, and how that may inform the consortium's approach to Music Information Retrieval and building interfaces for creative musical expression.

Musicians working with intelligent systems hold two parallel understandings of music simultaneously: On one hand there is the full embodied experience of playing and simultaneously experiencing music, and on the other hand there is the notion of how the machine or instrument understands the sounds in use. As the musician addresses the machine, it must be done in an awareness of, what the machine can do. *How can the computer assist me? What does it see? These are the kind of everyday questions, we ask all our technological devices: How do you work? How can that help me in what I am trying to do and, finally, why don't you work like I want you to?*

This document is an initial overview of the consortium's methodological strategies and the theoretical backdrop for trying to answer some of these questions within the context of the GiantSteps project.

1.1 The Position of User-centred Development within the Project

The GiantSteps project follows a highly user-centred approach to development. This will allow us to take advantage of the consortium's strengths, and bring new technologies from academic and industrial research to the user groups that will ultimately use these tools. To this end, the project incorporates a cyclical structural design to maintain strong cooperation with music and sound practitioners. One aspect of this design is a work process that consists of loops from open creative explorations, rapid prototyping, and measurements of results, as we expose scientific and technological developments to real-life scenarios.

The user-centred development process happens on two levels: On one hand, we will establish groups of expert-users who will follow the process for the duration of the project as well as hosting shorter workshop-like experiences. These are designed to explore a particular issue or development, or test the findings from our expert-user group against groups of other types of users. On the other hand, we will expose the achievements made to large groups of developing and expert users at the Red Bull Music Academy and at Music

Hack Days. The longitudinal aspect of some of the user groups is intended to allow users to have continuous and sustained input to the design and development process as the project progresses.

We will strive towards open and collaborative work methods to facilitate testing of user interface features during the development process. The underlying concern for this process is to not just improve on existing user interfaces for electronic music but rather aim for interface structures that might fit better with our associated musicians' mental images of the music that they make. As such, we will not be measuring potential increases in efficiency in a quantitative way, but rather we will aim for providing increased flow and unbroken periods of concentration and creativity. To this end, we will be following the current research standards of collaborative and participatory design processes, as well as more traditional qualitative user involvement methodologies.
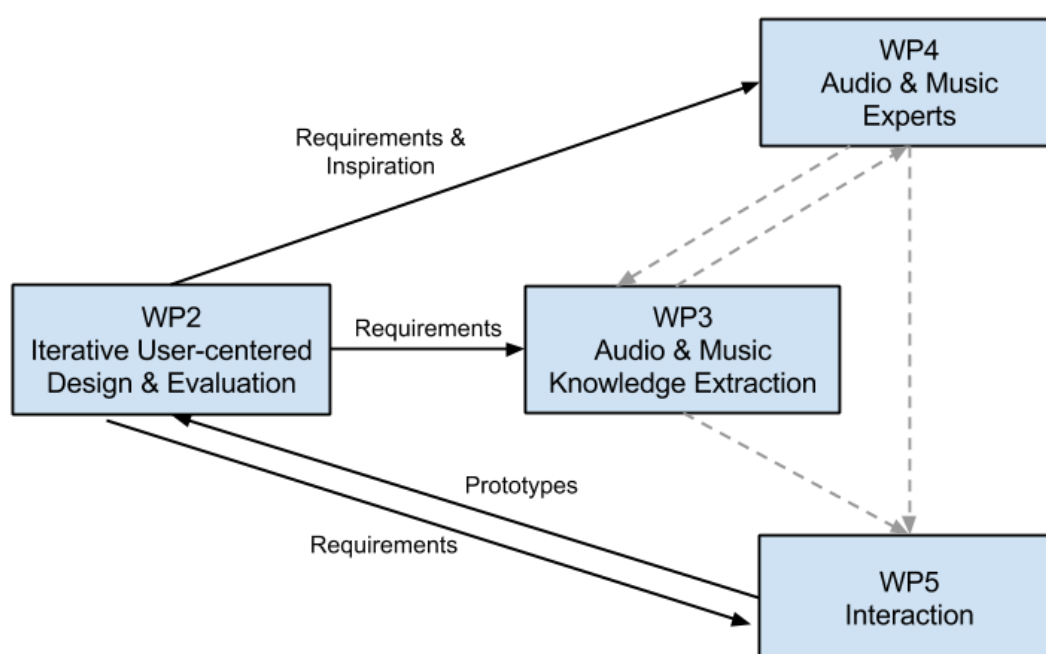
Figure 1: Position of user involvement within the project

1.2   Scope of Document

Work Package 2 (WP2) focuses on the requirements of the user-driven development process and the testing of prototypes with potential end-users. This includes the planning and organization of user tests and workshops, the conducting of user experiments in real-world scenarios, and the analysis of the obtained feedback. WP2 will inform WP4 ("Audio & Music Experts") and WP5 ("Interaction") of all results gathered during experimentation in order to refine their functionality. Information gathered through WP5 will in turn feed back into WP2.

This deliverable (D2.1) aims to outline the methodological foundations of user participation within the project. It contains a description of the methodological framework for user-

centred design and creativity evaluation to be used. A successful outcome for this work will be a shared methodological framework that allows the consortium to make use of the user data throughout the development process. The document will be revisited and updated in D2.3, which updates the methodological framework described in D2.1 and extends it with a collection of criteria for the evaluation of prototypes.

Each user event conducted within the GiantSteps project will be reported internally as it occurs, and the results communicated to all partners with a particular focus on the partners involved in WP4 ("Audio & Music Experts") and WP5 ("Interaction"). Each year the overall results are reported in the form of Annual Reports (D 2.2, D 2.4 and D 2.5).

2   STATE OF THE ART: USER INVOLVEMENT IN DESIGN PROCESSES

We will conduct the user involvement in the design process of the GiantSteps project in accordance to the state of the art within Design Research and Participatory Design methods as it is described in this section. At the same time we want to take a very practical and open-minded approach to this work, focusing on efficient and flexible formats and work methods, while making sure we maintain strong and meaningful relationships with our users and participants.

This process falls in two parts:

1. Participatory Design: Working with users in participatory processes to imagine, design and explore new options and potential solutions to working creatively with music, and

2. Qualitative User Testing: Establishing and understanding the qualitative user experience with a given (existing or experimental) interface or setup.

These two processes go hand in hand, with the experimental prototypes from the participatory processes being evaluated within the same framework as the qualitative user research into existing and new interfaces, and in turn the outcomes from the qualitative user experience evaluations generating inspiration and starting points for the participatory process. In the following chapters we will outline the background for these two approaches.

2.1   Participatory Design

Within HCI, the standards for user involvement have evolved from a traditional approach of metric user-testing of already designed systems, to understanding of users and their context through ethnographic methods and scenarios, towards an emerging focus on developing empathy with the user's experience of life. Wright and McCarthy state that "'knowing the user' in their lived and felt life involves understanding what it feels like to be that person, what their situation is like from their own perspective." [2008]

This mirrors a similar notion in Design Research, where the role of the designer can be seen to be moving from a 3rd person perspective (designing for society in general) to a 2nd person perspective (designing with a group of people or a part of society) towards a 1st person perspective (designing amongst the users in a peer-like relationship). Tomico et al describe this position as allowing "the designer not to be driven by his ego, but by a vision of a transcended future" guided and owned by users and stakeholders [Tomico et al, 2012].

Additionally, the understanding of the user is increasingly based on a phenomenological stance where the "way in which we come to understand the world, ourselves, and interaction, derives crucially from our location in a physical and social world as embodied actors" [Harrison et al, 2007], and terms such as materiality (the tactile aspect of an experience), non-coercive interfaces (expression and exploration rather than compliance and efficiency) and the emotional quality of experience are becoming increasingly common subjects in technology and design research [Hassenzahl et al, 2013].

This means that a design research process can increasingly be aimed at developing strategies for supporting the user in the role as "visionary" and "agenda setter" for a project, with the

designer or researcher acting as interpreter and facilitator [Verganti, 2009]. Such approaches are especially interesting for a project like GiantSteps where we are creating interfaces that can potentially be used for a means of creative expression at an expert or virtuoso level. By engaging a broad range of users in our development process, we will be able to engage with a broader range of viewpoints and backgrounds to enrich and widen the potential solution-domain for the project.

In the following we introduce the specific concepts that will be of relevance for our project: Experience Prototyping and Design Fictions, the Building of Props and constructing Mental Models of Sound.

2.1.1 Experience Prototyping and Design Fictions

When it comes to playing an instrument, whether it is traditional or new, the body of the performer has always been in the centre of things, with the control and sound properties of an instrument intimately linked to it's acoustical properties, technical execution, size, weight and construction. Considering our new "musical agents'' through the framework of objects and instruments, allows us to address the potential design and solution space through the performing body of the musician [Svanæs, 2013].

In order to capture and remain open to this relationship, we will involve our users through a participatory process of making prototypes in the form of non-functional, fictional technological objects. The sessions can for example be centred on establishing existing mental models of sound and samples, imagining new ones, and finally designing and making tentative exploratory physical models of the "machines that might make that sound". The "machines" come to act as props and explanatory objects that allow us to reach detailed and complex understandings of the possible modalities and abilities of a future interface idea. As such this process is an attempt to facilitate a lived experience of engaging directly with an essentially imaginary future object.

This type of work is anchored in critical design methods such as Placebo Designs [Dunne and Raby, 2002], practical methodologies like the Future Technology Workshops [Vavoula et al, 2002], and techniques for inspiration and understanding of users like the Cultural Probes [Gaver et al, 1999]. The process itself builds on Body Storming [Oulasvirta et al, 2003], Experience Prototyping [Buchenau and Suri, 2000] as well as a broad range of techniques from art [Dewey, 1958], theatre [Boal, 1992], dance [Kirsh, 2011] and performance [Cage, 1973].

2.1.2 Building Props

Props are containers of symbolic content [Storm, 2001] and as such they are tools for interacting with an overall context of an idea [Howard et al, 2002]. We will use props in the sense that they will function as tools for generating musical design fictions for the GiantSteps project. The prop allows us to fantasize and guess about it's own functionality and use. Certain features will be accidental, dictated by the material available and the short time in which it was built, but as the maker stands up to explain and "play", all features

(intended and unintended) work together to inspire and inform the presentation. In that moment of heightened alertness, the prop itself instructs us as to how it should be handled and used. This process makes use of mechanics similar to "pretend play": the ability to represent one object as two things at once, the ability to see one object as representing another, and the ability to represent mental representations [Lillard, 1993]. The child knows that the stick in his hand is a stick and yet at the same time, within the game it is also a sword. We as human beings can hold these two realities at once; they are both in some sense true simultaneously. The process mirrors Augusto Boal's games where educated, highly attuned forms of listening and paying attention allows the players to gather knowledge through improvisation [1992] and is in turn reminiscent of Callois' game spaces [1961]: as in a game we erect a tent in time where experimentation can take place.

In the participatory sessions we will build tentative and hypothetical models of instruments as non-functional mock-ups and prototypes. Such a process is created to facilitate an embodied conversation about the new interfaces, the project aims to build. Each resulting prop will reveal strengths and weaknesses in a proposed instrument or interface design, but more importantly the process temporarily frees the participants from considering practical and technical limitations and concerns, and look beyond the conceptual framework of existing interface paradigms.

At the end of each work session participants use their props to improvise an associated design fictional cognitive walkthrough. By postponing the moment where we talk about the new object until after it has taken some kind of (trashy, temporary) physical form, we hope to circumvent excuses and habitual internal monologues. In that sense the entire process can be seen as a head-fake [Pausch, 2008], an elaborate system that keeps us busy and engaged while distracting us from the real work taking place. The resulting objects are experimental prototypes of "technological matter", which allow analysis and meaning to be specified through physical and tactile interaction with the object itself.

2.1.3   Mental models of sound

As mentioned at the beginning of this document, it can be argued that musicians working with intelligent systems are holding two parallel understandings of music simultaneously: The embodied experience of playing and experiencing music, and the understanding of the ongoing processing of the sound that is situated inside the machine or instrument. In order for techniques from the domain of Music Information Retrieval to be able to describe music, an understanding of the nature and structure of music is essential. In a similar manner: to make it possible for someone to find something you must ask: How would you describe the thing that you are looking for? For this reason, the establishment of a deeper understanding of our users' mental models of sound and music, and "naive" understandings of the computational systems they work with [Hayes, 1978] is a additional focus for the project. In order to create meaningful systems utilizing Music Information Retrieval techniques and workflows building on them, we must strive to gain a deeper understanding of the relevant musicological aspects as perceived by our users, so that we in turn can suggest new ways to work with musical information in a contextually meaningful manner.

We are choosing to approach this by deliberately using experimental and idiosyncratic approaches to address the challenges and needs of musicians. Throughout our prototyping processes, the underlying question remains: Which technology would you want, if you could have anything at all? In practise as the process moves on, this will be refined to questions like:

- When is an algorithm good enough?

- How can you imagine "marking" sound?

- How can you annotate musical fragments so that they remain available to you?

- Can you imagine a system that is able to make valuable suggestion in real time?

- Could these suggestions serve as push back and creatively beneficial obstructions as well?

- and finally: What would it mean for your music if such a thing actually worked?

2.2   Qualitative User Testing

It can be argued that measuring creativity remains a rather elusive concept. When it comes to interfaces for creative expression, traditional quantitative measures for effectiveness (such as click rate and keystroke rate) does little beyond maybe identifying mere software bugs and interface inconsistencies. While such issues are important and should be identified and fixed, we do not believe that such methods will help us imagining the next set of interface paradigms for creative musical expression. Instead we want to pursue a user experience targeted evaluation strategy. Observing users directly interacting with tools and prototypes, logging these observations, and analysing their experience afterwards. This should enable us to:

1. Tap into the user' experience of using an interface: Did the creative task unfold in a way that "makes sense" to the user, and trying also to answer the question whether the experience was pleasant or frustrating.

2. Allow the user to self-assess the result in a qualitative manner: Did the user achieve something that holds a self-assessed creative value, and did the tool influence the outcome in a positive way?

3. Estimate the value of new functionalities: Would such a tool be useful to the respective user, and how would the user use it. How would it fit into the context of the user's existing tools and setups?

Additionally the qualitative user testing in the context of the project will focus on smaller user groups instead of large numbers of users, with the intention to work with them closely and repeatedly throughout the duration of the project. This will allow us to go beyond individual quantitative testing of new workflows, but rather to get a coherent, overarching impression of how the designs and developments coming out of the project benefit the real-life creative process of the artists participating in our test sessions. To this end, we will complement task-based user tests with interviews and, wherever possible, observations of

real-life workflows carried out by artists as they work towards a creative achievements we aim to support with the outcome of the project.

In the following sections, we outline how we plan to conduct this qualitative user experience evaluation. This process will be used initially to establish existing musical, creative and technical practise, and later on to evaluate prototypes and new tool or interface elements. Our process will be centred on the methods we deem most useful for the registration and documentation of user experience within the project: Interviews, Task Analysis, Understanding Existing Practise, Cognitive Walkthroughs and Affinity Diagrams.

2.2.1 Interviews

The scientific discourse around the design of interviews has produced a range of formats. In this range, two extremes can be made out: On the one hand, the fully structured quantitative interview with predefined questions and answers, where the interviewer reads out the question and sometimes the answers, then checks which answer fits the response given by the interviewee. This format has proven especially useful in clinical research, where symptoms need to be mapped to possible diagnoses without much variability in the vast majority of cases [Rogers, 2001].

On the other end of the range, we see the open, unstructured, narrative interview. In this format, the interviewer asks questions that are designed to spark narration from the interviewee, while the interviewer can adapt and ask follow-up questions wherever necessary [Bernard, 2000]. Within cultural sciences, the practice is leaning towards the qualitative interview, allowing the interviewee more freedom in answering questions, while also empowering the interviewer to adapt the flow of topics and steer the interview in directions deemed interesting for the research [Atteslander, 2006]. However, even though the field of cultural sciences favors qualitative methods, this does not allow for a lack of preparation for interviews. Bernard [2006] points out the need to practice before conducting the interviews, as well as for preparation of the topics to be covered. First and foremost, the underlying research interest must be defined. To achieve this, the researcher needs to identify a possible sequence of topics and different types of questions should be phrased, allowing the researcher to navigate between these areas. Merton et al. [1990] suggest to include "transitional" questions, which move the topic from one area to another, and "mutational" questions that allow the interviewer to introduce entirely new topics that had not been touched on in the previous answers [Merton, 1990]. These questions can either be used by the interviewer to prepare for an unstructured, narrative interview, or they can be the basis for creating guide questions for a semi-structured interview format [see Bernard, 2000].

The semi-structured interview is employed widely in all fields of cultural research. It makes use of a field guide, containing pre-formulated questions, which are organized in blocks representing areas of interest for the research [Atteslander, 2006]. However, different from a fully structured interview format, these questions are not read out one after another, and there are no pre-defined answers in the guide. Bernard [2000] encourages the interviewer to rephrase the questions in order to fit the language style of the interview, and to leave out or add questions or even areas of interest. In any case, it is recognized as crucial to keep the

questions, and indeed any communication by the interviewer, non-directional in the sense of not communicating any bias towards one possible answer the interviewee could give [see Bernard, 2000, Goodman et al., 2012]. Although it is also established in observer theory [e.g. Fuchs, 2010] that no researcher can avoid influencing the field of research, creating non-directed questions and avoiding any form of bias as much as possible is a proven method to improve the quality of results and to avoid research that solely proves the designers right.

2.2.2   Task Analysis

As part of a larger design evaluation, different methods of analyzing and assessing individual tasks have been established. To prepare for this, larger workflows identified as relevant for the research project are broken up into individual tasks by the researchers, identifying their hierarchical structure and selecting tasks for testing based on their placement within this hierarchy [Shepherd, 2001]. Participants in the user tests are then either asked to carry out the tasks, if the designs are variations on existing products and the participants are already familiar with very similar tasks, or they are introduced to the task at hand in a cognitive walkthrough (see below). Historically, task analysis has often been based on quantitative methods, such as measuring system response times and reaction times on the part of the users [for an overview, see Balbo et al., 2008]. However, the rather qualitative methods of understanding whether system responses matched users' cognitive expectations, and whether the users encountered ambiguity at any point in the task completion, leading to disorientation and other problems, have proven successful [various examples in Diaper and Stanton, 2008] and are the preferred methods in the context of this project. To gain access to these insights, methods of task analysis can be combined with "think aloud" techniques, where users are asked and encouraged to express their thoughts on the progression of the task at hand and the overall system state they are confronted with at any time during the completion of the task [Dumas et al., 1999]. These expressions together with the observations of the researchers and potential data from the technical system on which the task was carried out are collected and analyzed by the designers, to identify successes and potentials for improvements in further design iterations.

2.2.3   Existing practise

In order to find out more about the detailed uses of workflows incorporating technology in real applications, the method of contextual inquiry has been used successfully in different industries. As described by Beyer and Holtzblatt [1998], this method is based on the notion of apprenticeship, where the researcher assumes a position similar to that of an apprentice learning the workflows, only with the aim of supporting the workflows with future developments instead of carrying them out him- or herself. For this, it is essential to observe the workflows being carried out in real-world applications. This can be achieved by augmenting the apprentice position with sessions of participatory observation, where the researcher assumes an actual role in the field of research [see DeWalt, 2011]. In the field of music, this can include participating in an audience during a concert or a studio session, or taking over small tasks in the process of a studio production. This is usually coupled with

note taking, sketching of the spatiality of situations, and frequent interviewing. This way, the researcher maintains a specific standing in the field, which also helps to explain his or her participation in the activities.

2.2.4   Cognitive walkthroughs

This method is used in prototype testing and has proven valuable for the assessment of individual steps in new workflows. It is normally conducted without external test participants, although it can also be conducted in tandem between one researcher and one test participant. As described by Dix et al. [2004], the researchers walk through a sequence of steps in the workflow, trying to comment and criticize every individual step. In addition, the researchers provide critique on the overall sequence after all steps have been completed. Lewis and Wharton [1997] point out the limitations of the method: Since it uses workflow sequences that are already considered to be correct by the designers, the method can more or less only provide an insight into whether the workflow is accessible and might be adopted by the users. What is missing is a predictive dimension, where the researcher can vary his or her behavior.

The lack of variance can, however, also be seen as a strength of the method. Since it allows for testing of very specific parts of a proposed workflow, it gives researchers and designers the ability to collect very detailed and focused information, which can be fed back into the design and development process. Whereas other, more open methods usually require the researchers and designers to adapt findings in different stages of analysis in order to be useful as input for further design work, the data generated in cognitive walkthroughs can be directly correlated to necessary next steps in designing the workflows. For this, as for all methods employed in the research, it is essential to record the entire session and to constantly take notes while conducting it, as Dix et al. [2004] point out.

2.2.5   Affinity diagrams

Creating affinity diagrams is a method to efficiently generate an overview of sentiments offered by test participants towards the design that was tested, or towards the product in the focus of the research. It was pioneered by Jiro Kawakita as a part of the Japanese quality movement in the second half of the 20th century [Kawakita, 1982]. Applying the method, the researcher collects individual statements containing quality evaluations offered by participants on cards, and groups them based on similarity. Hanington and Martin [2012] suggest using different colours for the participants, to identify how broad an issue might be, as different sizes of card groups already hint at the importance of a qualitative evaluation. Affinity diagrams can also be used in the final report on a research session, potentially after duplicate statements have been removed and indications of quantity have been added to the cards. The researchers then have the freedom to include only cards above a certain threshold of instances of statements from participants.

3   USER INVOLVEMENT IN GIANTSTEPS

The overall goals of the user involvement in GiantSteps are:

- Establish a range of current creative practices for musical expression, which is independent of any style or genre limitation

- Explore mental models of musical qualities that we can support through workflow improvisations

- Produce a broad range of user-generated ideas through explorative making, which can be used to feed the design process of the project

- Inspire and focus research and development on the non-design related tasks within the project, such as musical expert agents or music information retrieval algorithms

- Evaluate iteratively the prototypes built based on the ideas created through the participatory design sessions

- Explore potential user acceptance and possible commercialisation through user tests with "finalized" prototypes

Testing users' experiences with the solutions, we aim to develop, while we develop them, is crucial to coming up with results that do not just have theoretical merit, but are successfully being used by musicians, supporting their creativity while fitting in with existing and established workflows they are used to. The challenge for any type of user testing is being able to observe user behaviour in, what is as close to real situations of creative productivity as possible. However, while we design our user tests to be as realistic as possible, we are aware that our hands-on testing sessions can at best simulate the fine-grained steps and tasks in a new workflow, and that the results from these sessions do not prove or disprove a feature but rather give some indication towards whether a new feature may be successfully adopted in the actual productive work done by the users. Part of the reason for this lies in the nature of the situation in which we test prototypes and new workflows: While the technology we are developing is designed to be used in situations of socio-cultural complexity e.g. artists working on new music material, anticipating reactions from their publics and audiences, or performing their music on stage in front of a critical audience -, the environments in which we conduct user tests are usually reduced to situations of limited complexity, where artists are asked to carry out tasks while essentially pretending to be in their usual mode of productivity.

The resulting knowledge about the usability of individual steps in the workflows we design and develop remains essential for our work, but in acknowledgement of these issues, we choose to take a qualitative rather than a quantitative approach as we proceed to carry out user testing of prototypes and ideas. To this end we will employ the methods explained above. In addition, we aim to alleviate any shortcomings of these tests by complementing the focus on technical prototypes and interfaces with interviews and other qualitative measures of contextual inquiry. A deeper understanding of the cultural background and real-life productive workflows of our user groups will allow us to design and target the experiences for the users participating in our tests.

3.1   User Group Definitions

Various approaches have been suggested to integrate a thorough understanding of the user's needs and desires into a design process, and provide a conceptual model of the user that remains available anytime during the design process, even when actual real-life users are not. Even though they are not explicitly labelled as such, the user groups defined in the following are derived and being treated in the spirit of Cooper's notion of Personas [1999] throughout the design process. In order to derive a set of detailed design requirements, the GiantSteps project will use a combination of several informal techniques to iteratively set up the requirements as suggested by Preece [2002].

As the GiantStep project aims to appeal to broad user groups, it is crucial to assemble the user groups in such a way that they address a broad range of expertise: from professionally practicing musicians through non-musicians to the traditional music consumer and children. It is important to note that the musicians and performers involved in the GiantSteps design process are not limited to a specific musical format, genre, or style, rather they are encouraged to use and misuse the provided functionality to their liking and use it for compositions of any type of music. The groups are defined as follows:

- Expert Users: The first user group is defined as professionally practicing musicians, who are literate in producing music with the help of computer software. Members of this group can be found amongst participants of the Red Bull Music Academy, visiting musicians at STEIM or members of Native Instrument's in-house and beta user test groups. They are highly experienced with computer-based music production and performance with software such as digital audio workstation and digital DJ'ing software.

- Non-Expert Users: The second user group is defined as non-experts, who are literate in computer software and/or are creative in realms such as visual design, photography or video production. They can also be practicing musicians that are not experienced in using music software such as digital audio workstation and digital DJing software, or comparable software.

- Children: The third user group is children in the age group of 9 to 12 years. It is reasonable to assume that children in this age group, while somewhat computer literate, have not been exposed to software for music production, allowing them to potentially approach the visual and structural representation of music over time with an open mind.

During the course of the project the project consortium will monitor whether the requirements for the design process can be established based on this user group partitioning. Should the iterative design process of the GiantSteps project require a finer-grained partitioning of potential users into groups, the project consortium will revise this partitioning in D2.3, which updates the methodological framework described here.

3.2   User Group Composition

The user sessions that feed the iterative design process will be held in four fixed settings: the Red Bull Music Academy workshops, the Music Hack Days organized by the Music Technology Group at the University Pompua Fabra in Barcelona, at Native Instruments, and at STEIM. Due to these fixed workshop settings, the consortium is bound to two different temporal user group structures: Ad-hoc and (semi) longitudinal user groups:

Ad-hoc user groups will be formed at the Music Hack Days and at the Red Bull Music Academy workshops in a spur-of-the-moment fashion, as the consortium will not know in advance which individuals exactly to expect, however, it is certain due to the events' structures that the individuals participating there in the design sessions and user tests will match into the expert and non-expert user groups. Ad-hoc groups will also be engaged in short, targeted workshops for investigation of a particular interface detail or prototype later in the project process.

For the establishment of current practise and mental models as well as the participatory design sessions (semi) longitudinal user groups will be established that will ensure sustained influence and continuous feedback on the design process. The longitudinal groups will be composed of users matching all three user groups. We recognise and acknowledge that it will be practically and logistically impossible to ensure a three year commitment from all users and we aim to address this issue by establishing a larger pool of users from which we draw the participants in each session. As the project evolves we reserve the right to add new users to the groups to either compensate for logistical issues or focus the group toward a developing direction of the project. We may also spread out the workshops into several smaller events spread over time (within the agreed milestone timeframes) in order to facilitate the availability of touring musicians and compensate for external factors such as school holidays. We believe that these measures will ensure the ability to establish longer conversations with users and at the same time provides enough flexibility to effectively deal with scheduling issues. It is important to note at this point, that the longitudinal groups will be small and aimed towards qualitative and inspirational results and we do not necessarily aim to produce data sets of formal statistical validity from these types of sessions.

3.3   Plan for User Involvement

	2013								2014													2015										2016			
	Jan						July						Jan						July						Jan						July					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Initial Design Workshops at STEIM Experts								■																												
Initial Design Workshops at STEIM Non-Experts								■																												
Initial Design Workshops at STEIM Children								■																												
Ad-Hoc User Tests at STEIM									░	░	░	░																								
MHD Sonar 2014										■																										
Initial User Tests at Native Instruments											■																									
RBMA 2014												■																								
Ad-Hoc User Tests at STEIM													░	░	░	░	░	░	░	░	░	░	░	░												
Ad-Hoc User Tests at Native Instruments													░	░	░	░	░	░	░	░	░	░	░	░												
Ongoing Design Workshops at STEIM Experts																				■																
Ongoing Design Workshops at STEIM Non-Experts																					■															
Ongoing Design Workshops at STEIM Children																						■														
MHD Sonar 2015																							■													
RBMA 2015																								■												
Ad-Hoc User Tests at STEIM																									░	░	░	░	░	░	░	░	░	░	░	░
Ad-Hoc User Tests at Native Instruments																									░	░	░	░	░	░	░	░	░	░	░	░
Ongoing Design Workshops at STEIM Experts																															■					
Ongoing Design Workshops at STEIM Non-Experts																																■				
Ongoing Design Workshops at STEIM Children																																	■			
MHD Sonar 2016																																		■		
RBMA 2016																																				■

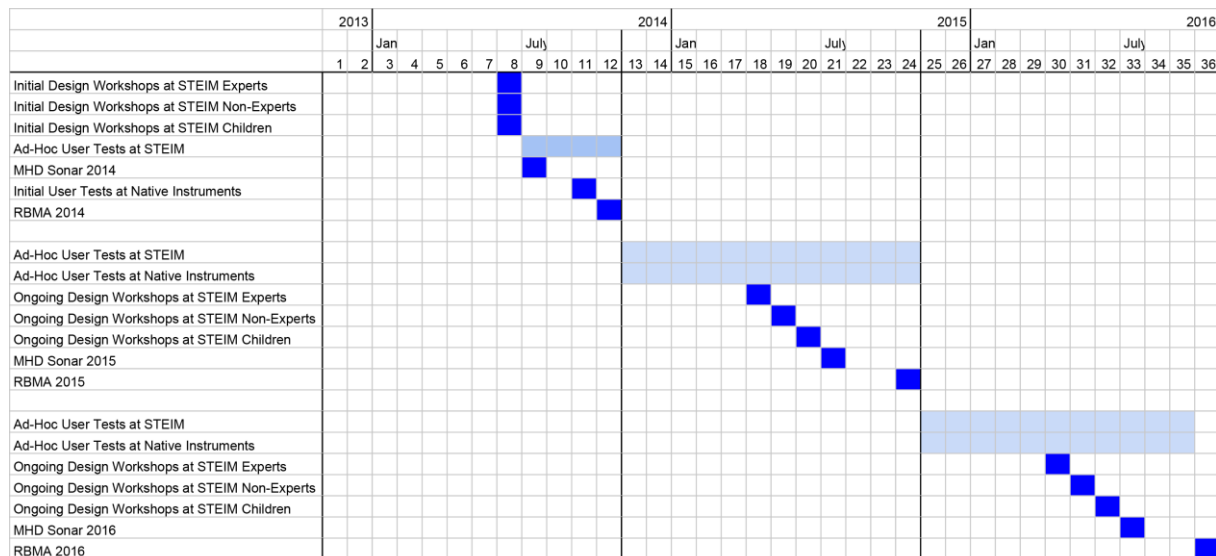Figure 2: The exact dates for some of these events may move to accommodate the availability of our users.

3.3.1   Year 1:

- M08: Initial sessions with expert users and musicians at STEIM (Amsterdam)
    - Goal: investigating existing work practices, mental models and engage in explorative making session.
    - Structural Goal: establishing the initial longitude groups of musicians.
- M08: Initial sessions with non-expert users at STEIM (Amsterdam)
    - Goal: investigating mental models and engage in explorative making session.
    - Structural Goal: establishing the initial longitude groups of non-expert users.
- M08: Initial sessions with children at STEIM (Amsterdam)
    - Goal: investigating mental models and engage in explorative making session.
    - Structural Goal: establishing the initial longitude groups of children.
- M09-14: Ad-hoc sessions with expert users and musicians at STEIM (Amsterdam)
    - Goal: investigating existing work practise, mental models and engage in explorative making session.
- M09-14: Ad-hoc sessions with non-expert users at STEIM (Amsterdam)
    - Goal: investigating mental models and engage in explorative making session.
- M09-14: Ad-hoc sessions with children at STEIM (Amsterdam)
    - Goal: investigating mental models and engage in explorative making session.
- M09: First Music Hack Day at Universitat Pompeu Fabra (Barcelona)

- Goal: Music Hack session generating explorative interfaces.

- M11: Initial sessions with expert users and musicians at Native Instruments (Berlin)

    - Goal: Explorative design sessions, design reviews, investigating prototypes.

    - Structural Goal: establishing the initial longitude groups of expert users.

- M12: Red Bull Music Academy in Tokyo

    - Goal: investigating existing work practices, mental models, and exposing expert users to interface prototypes.

3.3.2   Year 2:

- M13-24: Ad-hoc sessions with expert users and musicians at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M13-24: Ad-hoc sessions with non-expert users at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M13-24: Ad-hoc sessions with children at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M13-24: Ad-hoc sessions with expert users and musicians at Native Instruments (Berlin)

    - Goal: Explorative design sessions, design reviews, investigating prototypes.

- M18: Ongoing sessions with expert users and musicians at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M19: Ongoing sessions with non-expert users at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M20: Ongoing sessions with children at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M21: Music Hack Day at Universitat Pompeu Fabra (Barcelona)

    - Goal: Music Hack session generating explorative interfaces.

- M24: Red Bull Music Academy (location to be established)

    - Goal: investigating existing work practise, mental models and exposing expert users to interface prototypes.

3.3.3   Year 3::

- M25-35: Ad-hoc sessions with expert users and musicians at STEIM (Amsterdam)

    - Goal: explorative making session and prototype evaluations.

- M25-35: Ad-hoc sessions with non-expert users at STEIM (Amsterdam)

- Goal: explorative making session and prototype evaluations.

- M25-35: Ad-hoc sessions with children at STEIM (Amsterdam)
  - Goal: explorative making session and prototype evaluations.

- M25-35: Ad-hoc sessions with expert users and musicians at Native Instruments (Berlin)
  - Goal: Explorative design sessions, design reviews, investigating prototypes.

- M30: Ongoing sessions with expert users and musicians at STEIM (Amsterdam)
  - Goal: explorative making session and prototype evaluations.

- M31: Ongoing sessions with non-expert users at STEIM (Amsterdam)
  - Goal: explorative making session and prototype evaluations.

- M32: Ongoing sessions with children at STEIM (Amsterdam)
  - Goal: explorative making session and prototype evaluations.

- M33: Music Hack Day at Universitat Pompeu Fabra (Barcelona)
  - Goal: Music Hack session generating explorative interfaces.

- M36: Red Bull Music Academy (location to be established)
  - Goal: investigating existing work practise, mental models and exposing expert users to interface prototypes.

4   GIANTSTEPS USER EXPERIENCE FRAMEWORK

The experiment framework for the user involvement in the GiantSteps project is based on the theoretical background described in chapter 2 and will be executed in a manner as uniform and practical as possible. This chapter outlines the formats for capturing the user experience, suggests specific guides to each type of event (while making use of the predefined formats) and provides guidelines for user consent forms, documentation, naming conventions, ethics considerations and reporting guidelines. A set of templates has been developed and is available as annexes at the end of this document.

4.1   User Experience Formats

In the following, the user involvement elements that will be utilized throughout the project and across the various sessions are detailed. They are based on the definitions and conventions described in chapter 2.3 "Qualitative User Testing".

4.1.1   Interviews and Questionnaires

Within the GiantSteps project, interviews and questionnaires are used in two ways:

1.   to determine the basic profile of each user, age, gender, level of experience, etc. and

2.   to explore more specific aspects of a user's profile.

The first type of questionnaire provides us with basic statistical information and is filled in by all users while the latter type is used to answer more detailed and contextually dependent queries. This might include but is in no way limited to, questions regarding preference and cultural imprint in musical style and genre, workflow, performance and musical ideas. Examples of this could be:

- What is a musical style for you?
- How would you describe your musical style?
- How does your musical style relate to other styles?

- What is a music genre for you?
- How would you describe your music genre?
- How does your music genre relate to other genres?

- Which elements exist in your production workflow?
- Which elements exist in your performance?
- Which steps lead you to a musical idea?

- Where do you see shortcomings in your current production workflow?

- What would you like to be able to do to improve your production workflow?

- How would you want to see these improvements integrated into your current production workflow?

These types of questions will be tailored to each specific event and reflect the current concerns within the project. Answers are analysed using methods such as Affinity Diagrams.

4.1.2 Cognitive Walkthroughs

A cognitive walkthrough allows the user to execute a task while "thinking out loud". This type of inquiry is used to investigate users' workflow strategies and potential cognitive and conceptual shortcomings in an interface or setup. This method can be used both to record existing work setups and prototypes. In the case of non-functional prototypes this method functions in a similar manner as "paper-prototypes" [Sefelin et al, 2003] or "wizard of oz" [Kelley, 1983] investigations. The technical setup for this format is as follows:

- The session is recorded on video.

- The camera captures the hardware and/or software, the users hands and voice, but not face. The user should not feel like having to perform in front of the camera.

- If hardware and the computer display are too far apart, two cameras should be used.

- The user is asked to perform certain tasks and describe the process while performing them.

- If he is not comfortable with a certain task, it can be skipped without a problem.

- The user can suggest other tasks to execute.

- It is made clear to the user that if (s)he encounters problems or gets stuck performing any action, it is not his or her fault but that the function simply is not intuitive enough yet, and that finding such kinks is exactly the valued outcome of the project.

- Tasks move from general to more specific.

If needed and appropriate it is possible to include an additional recording where the users reviews their own video and adds additional commentary. Cognitive walkthroughs are analyzed with the following research questions in mind:

- Which actions were performed on hardware vs. software?

- Which actions triggered the response expected by the user, and which ones led to unexpected results?

- During which actions did the user get stuck or had to think about what to do?

- Did the user have to consult external help for any action?

4.1.3   Mental Models of Sound

This format is created to facilitate the capture of a participant's perception and individual representation of temporal structures and developments in music. The process is executed as follows:

- Participants are presented with a wide array of materials.

- They are asked to listen to a track.

- While the track is playing, participants are encouraged to draw the internal structure of the track.

- They are encouraged to use any form, material or colour.

- After the track has finished, we play the track again and ask you to explain its internal structure while it plays.

- The drawing can be annotated in writing.

This process may be repeated several times with different types of tracks. The session may occur in a group setting or as a solo session. The results are photographed.

4.1.4   Participatory Design Workshop

The building on non-functional prototypes is used to allow the participants to create embodied instrument props to illustrate their mental model of the experience of playing music. As such this format is focussed on the active performance of sound and how it may or may not conform to existing and proposed user interface paradigms. The prototypes are built as active props in a rapid making process using non-technological material such as cardboard, paper, plastics and fabric, animated and investigated through the live experience of their (proposed) functionality. The materials are deliberately chosen to allow a broad range of physical expression and the participants are discouraged from creating functional acoustic instruments. The session will proceed as follows:

- The session is conducted with small groups of participants.

- The location is a quiet space with a large working table, where an assortment of materials and tools are collected.

- Participants are introduced to the process via Arthur C. Clarke's Third Law of Technology Prediction [1984]: "Any sufficiently advanced technology is indistinguishable from magic." and asked to consider this in their work.

- The participants are asked to illustrate the sound they would like to make on a small piece of paper.

- The participants are asked to use the available materials to build the "machine" that makes that sound.

- Participants are then asked to present their prototype to the rest of the group as a performance or demonstration.

The results are photographed and the performance/presentation is recorded in the form of a Pitch Presentation, outlined in the following paragraph.

4.1.5 Pitch Presentations

A pitch presentation is a short presentation of an idea or prototype. The presentation involves the demonstration of how a prototype works, what it does and how it is played. This is recorded on video as a upper body/headshot. The technical setup for this format is as follows:

- The session is recorded on video.

- The camera captures the upper body of the participant (this can be modified to whole body or headshot, should the size of the prototype demand it).

- The participant is encouraged to consider this a performative moment, or alternatively in the case of non-performers, as an elevator pitch.

Pitch Presentations are analyzed with the following research questions in mind:

- Which modes of play are present in the prototype?

- Is the prototype reminiscent of existing instruments or interfaces?

- How can the prototype be evaluated in terms of plausibility, intimacy and range?

- Is the proposed functionality emerging from, or in contrast to its physical form?

- Does the prototype offer affordabilities that open up new avenues for explorations?

4.1.6 Observed Playing

The process of Observed Playing differs from a cognitive walkthrough in that it is much closer to the user's everyday experience of performing or producing music. These sessions are conducted in real studio environments that are common settings for music creation and production. In order to structure the session in a meaningful way, the participants are asked to pick a simple music machine they would like to use, and either:

1. work solo to create a short musical piece to perform live using that device, or

2. collaborate with another musician on a short musical piece.

They will have only a short time (~10 minutes) to work and prepare the performance. The process is filmed as unobtrusively as possible. The video is studied with a specific focus on: roles, role switching, propositions, segments/stages, trial and error, frustration, rewards,

dead ends, evolution, choice and selection, rejection, interventions, successes, failures, pauses, speed, and finally negotiations and creation temporal structure.

4.2 User Session Guides

In the following, each type of user-event is described, detailing which of the user research formats will be used and outlining the anticipated outcomes.

4.2.1 Expert Users Sessions at STEIM

Setting:

A large number of the workshops and user tests are conducted at STEIM. Electronic music in this context is always strongly related to the physical and direct actions of a musician. In this tradition, STEIM supports artists in residence such as composers and performers to develop instruments, which allow for improvisation and performance with individually designed technology. The session at STEIM are held in the studios and workspaces normally used by visiting artists and musicians and in this way they not only mirror but represent one type of real-world scenario for music making.

User group:

This type of session is conducted with **Expert Users** (as defined above). The sessions are held in three separate events spanning several days with 2-4 users involved in each. This session will be held once a year with as much longitude overlap in users as possible.

Goals:

The goal will initially be to establish a better understanding of the creative work methods of this user group, coupled with an exploration into their ideas for future instruments and interfaces. Later in the project the first phase of the session will shift from exploring existing interfaces to exploring and validating new prototypes, user interfaces, workflows and other results from the work in GiantSteps.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

   ▪ getting to know each user

   ▪ establishing user profile

   ▪ exploring cultural background and style

2. **Cognitive Walkthroughs** (as defined above)

- documenting existing patterns of work
- identifying opportunities for improvement

3. **Mental Models of Sound** (as defined above)

- exploring mental models of sound composition
- understanding how each user perceives the interaction with the technology

4. **Participatory Design Workshop** (as defined above)

- making three dimensional models of workflows
- imagining future goals for the interfaces
- each participatory design session ends with a Pitch Presentation

5. **Pitch Presentations** (as defined above)

- presenting your ideas out loud in a performative moment, potentially leading to Observed playing

6. **Observed Playing** (as defined above)

- exploring instruments, prototypes and props through live performance
- this can also in some cases take the form of actual concerts

Expected Outcomes:

These sessions will provide us with a deeper understanding of existing setups and workflow. We also expect them to be a valuable source of requirements and visions for the project. The longitudinal aspect of these sessions allows the users to not only provide requirements but also to validate and refine the requirements as the project proceeds.

4.2.2 Expert Users Sessions at Native Instruments

Setting:

The design sessions and user tests that are held at Native Instruments will be used to carry out participatory design and prototype testing. The sessions will be held regularly with a longitudinal user group of professional musicians. The prototype testing sessions will mostly follow the formats of observed playing and cognitive walkthroughs, whereas participatory design sessions will be carried out in the form of questionnaires.

User group:

This type of session is conducted with **Expert Users** (as defined above). The sessions are held in one initial event before the first expert user tests at the Red Bull Music Academy, and then continuously in an ad-hoc fashion spanning the whole project lifecycle with as much longitude overlap in users as possible.

Goals:

The goal of these sessions is to validate user interfaces, workflows and also algorithms developed in the context of the GiantSteps project.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

   - getting to know each user

   - establishing user profile

   - exploring cultural background and style

2. **Cognitive Walkthroughs** (as defined above)

   - documenting existing patterns of work

   - identifying opportunities for improvement

3. **Participatory Design Workshop** (as defined above)

   - making three dimensional models of workflows

   - imagining future goals for the interfaces

4. **Observed Playing** (as defined above)

   - exploring instruments, prototypes and props through live performance

Expected Outcomes:

We expect these sessions to be a valuable source of user feedback on detail questions especially on user interaction and workflow improvements concerning mainly professional musicians.

4.2.3 Expert and non-expert users sessions at the Music Hack Days

Setting:

The Music Hack Days are independently organized hack day events sponsored by music technology companies and universities. They attract up to 200 attendees, mostly music-affine software developers. The project consortium will use the annual Music Hack Day event in Barcelona (organized by the MTG in parallel to the popular Sonar Festival for electronic music) to do ad-hoc prototype testing sessions. The Music Hack Day events will also contribute to the dissemination of public APIs.

User group:

This type of session is conducted with **Expert Users** and **Non-Expert Users** (as defined above).

Goals:

The goal of these sessions is to validate user interfaces, workflows and also algorithms developed in the context of the project.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

   ▪ getting to know each user

   ▪ establishing user profile

   ▪ exploring cultural background and style

2. **Pitch Presentations** (as defined above)

   ▪ presenting your ideas out loud in a performative moment, potentially leading to Observed playing

3. **Observed Playing** (as defined above)

   ▪ exploring instruments, prototypes and props through live performance

Expected Outcomes:

We expect these sessions to be a valuable source for feedback on API design, user experience design and general acceptance and usefulness of the developed technology.

4.2.4 Expert users sessions at the Red Bull Music Academy

Setting:

The Red Bull Music Academy is a world-travelling series of music workshops with invited "up and coming producers, singers, sound artists, DJs and musicians from around the world learn from and collaborate with top industry professionals." [Muggs, 2011] In addition to serving as the main test-bed for the prototypes developed with new and unbiased high-end users, the Red Bull Music Academies (organized by YDS) and their participants are one of the biggest assets for successful dissemination of the project's results. Each academy consists of lectures, workshops, and concert performances at renowned local venues and will be the perfect setting for user testing as well as enhancing the project's visibility worldwide. Since participation in an Academy requires essential developments to be finished and integrated, every Red Bull Music Academy also marks the end of an annual development cycle and a milestone of the project. The final prototypes will be obtained by month 34 and exposed during the third and last Red Bull Music Academy workshop.

User group:

This type of session is conducted with **Expert Users** (as defined above). We will carry out test ad-hoc test sessions of finalized prototypes with professional musicians.

Goals:

The goal of these sessions is to validate user interfaces, workflows and also algorithms developed in the context of the GiantSteps project.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

    - getting to know each user

    - establishing user profile

    - exploring cultural background and style

2. **Cognitive Walkthroughs** (as defined above)

    - documenting existing patterns of work

    - identifying opportunities for improvement

3. **Observed Playing** (as defined above)

    - exploring instruments, prototypes and props through live performance

Expected Outcomes: We expect these sessions to be a valuable source for feedback on user experience design and general acceptance and usefulness of the developed technology.

4.2.5   Non-expert users sessions at STEIM

Setting:

Non-expert user sessions are conducted at STEIM (described above).

User group:

This type of session is conducted with Non-Expert Users (as defined above). The sessions are arranged on an ad-hoc basis with groups of 4-10 users, with the size of each group dictated by various logistical concerns.

Goals:

The goal will initially be to establish a better understanding of the creative work methods of this user group, coupled with an exploration into their ideas for future instruments and interfaces. Later in the project the first phase of the session will shift from exploring existing interfaces to exploring and validating new prototypes, user interfaces, workflows and other results from the work in GiantSteps. These sessions can also be arranged with the specific goal to test, explore or validate a particular interface issue or concern.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

   - getting to know each user
   - establishing user profile

2. **Mental Models of Sound** (as defined above)

   - exploring mental models of sound

3. **Participatory Design Workshop** (as defined above)

   - making three dimensional models of workflows
   - imagining future goals for the interfaces
   - each participatory design session ends with a Pitch Presentation

4. **Pitch Presentations** (as defined above)

   - presenting your ideas out loud in a performative moment

Expected Outcomes:

We expect to be able to use these sessions to test, explore or validate detailed aspects of the outcomes GiantSteps work. Since they are conducted on an ad-hoc basis, these sessions will be useful for testing individual aspects or concerns within the project.

4.2.6   Children's user sessions at STEIM

Setting:

Children's user sessions are conducted at STEIM (described above).

User group:

This type of session is conducted with **Children** (as defined above). They will be focussed on a particular issue and much shorter than an adult session (1-2 hours). These sessions will be held 3-4 times a year with as much longitude overlap in child users as possible.

Goals:

The goal will initially be to establish children as a valid and engaged group of participatory design collaborators. We will use these sessions to gain a deeper understanding of their ideas for future instruments and interfaces. Later in the project part of the focus will shift to exploring new prototypes and results from the work in GiantSteps.

The sessions can consist of:

1. **Interviews and Questionnaires** (as defined above)

    ▪ getting to know each child

    ▪ establishing user profile

2. **Mental Models of Sound** (as defined above)

    ▪ exploring mental models of sound

3. **Participatory Design Workshop** (as defined above)

    ▪ making three dimensional models of workflows

    ▪ imagining future goals for the interfaces

    ▪ each participatory design session ends with a Pitch Presentation

4. **Pitch Presentations** (as defined above)

    ▪ presenting your ideas out loud in a performative moment

Expected Outcomes:

We expect these sessions to be a valuable source of inspiration and design for the project. The children are not engaged as testers or target audience as such, but rather as collaborators and fellow researchers. The outcomes will be used to inspire and broaden the conceptual design of our prototypes.

4.3   Ethics Considerations

4.3.1   Workshop Participation Consent Form

Before engaging in a user session each user (or in the case of children: parent or guardian) will be presented with a "Workshop Participation Consent" form. It lists the project name, name of workshop leader, date, location and the following text:

- I understand and agree to take part in this workshop.

- I understand that I may withdraw from the workshop at any stage and that this will not affect my status now or in the future.

- I understand that while information recorded during the workshop may be published, I will not be identified and my personal details will remain confidential. I understand

that I will not be identified by name in any published materials without notification and my express permission.

- I understand that I may be photographed, recorded or videotaped during the workshop.

- I understand that data will be stored electronically and that only authorised staff associated with the workshop project may have access to all materials.

- I understand that I may contact the workshop leader if I require further information about the project, or I wish to withdraw my consent.

- I understand that the results of this workshop may be published in project reports, academic conferences and journals; and or book chapters. Results may also be published as public presentation or exhibition.

This document is signed and dated by the participant, who is also provided with a "Project Information Sheet", as described in the following paragraph. An example of the Workshop Participation Consent Form is attached as an appendix.

4.3.2   Project Information Sheet

The project information sheet is an explanatory statement that serves to inform the user as to the goals and purposes of the overall project. It covers subjects such as:

1. What is the purpose and aim of the project?
2. Which organisations are involved in the overall project?
3. What are the possible outcomes and benefits of the project?

The document goes on to very briefly outline:

1. Why you have been chosen to participate.
2. What this specific workshop/session will involve.
3. How much time it will take.
4. Inconvenience or discomfort.
5. Payment.
6. Withdrawal.
7. Confidentiality.
8. Storage of data.
9. Potential publication.

The document is written in straight forward everyday language and includes links to websites where the participant may find more information and contact details in order to allow the participant to contact the responsible workshop leader with additional questions

and concerns after the workshop is concluded. The Project Information Sheet is approximately 2 pages long and is kept by the workshop participant.

4.3.3 Data Protection

Several types of data will be collected through the user involvement in GiantSteps:

1. personal data, user contact details and signed consent forms,

2. anonymised statistical data such as gender and age,

3. creative output in the form of drawings and prototypes,

4. recorded interviews and cognitive walkthroughs,

5. recorded musical performances.

We will deploy different strategies in terms of how we handle and protect this data.

1. Personal data, such as user contact details and signed consent forms is to be stored encrypted on hard drives locked away in a secure storage place at the organization where the user test was conducted, and additionally a second copy of all data is to be stored centrally on an encrypted server-space to be provided by JCP-Consult. This data is used to manage the longitude user groups and at the end of the GiantSteps project this data will be safely destroyed.

2. Anonymised statistical data, such as gender and age, gathered through the questionnaires is used to analyse and ensure a reasonable distribution and focus is each group. This information is not labelled by name but by a unique identifier code. All collected user test data is to be stored encrypted on hard drives locked away in a secure storage place at NI and STEIM, making sure that the data is doubled and thus backed up.

3, 4 and 5. Creative output in the form of drawings and prototypes, recorded interviews and cognitive walkthroughs, and recorded musical performances are stored at STEIM and NI for the purpose of executing investigation development and innovation studies, works or projects. This data is not labelled by user name but by a unique identifier code. These data may be disclosed, with a user's previous consent to entities that collaborate in the development of research activity and to third parties when such a disclosure is authorized by law.

Participants retain the rights to withdraw their data from the project at any time. Rights to access, correct, cancel or object to data in these files may be exercised by applying in writing, including a photocopy of your identity card or equivalent to the project manager, Dr. Joost Geurts.

4.4 Documentation and Data Formats

All material gathered during any user session will be anonymised and organized into one data store (folder) per user and session, whereby each folder is to be named with the unique identifier of the user, the name of the organisation where the user test was conducted, the name of the test session and the date in the following format: Organisation_SessionName_UserId_DDMMYYYY. The folder name containing material for the user "John Doe" with the unique identifier code "User067", who participated in the first design session at the STEIM in Amsterdam on the 18th of June 2014 should following the format be named as follows: "STEIM_DesignSession01_User067_18062014".

The hand-written test protocol and any other notes that are taken by hand by the person documenting and/or supervising the user session are to be digitized into plain text format and named "Organisation_SessionName_UserId_DDMMYYYY.Protocol.txt". Any original hand-written documents are to be photographed or scanned and stored in the PNG file format with a resolution of a minimum of 2480x3508 pixel (A4 scan at 300dpi). All original files are to be named with a dot-separated incrementing number: "Organisation_SessionName_UserId_DDMMYYYY.Protocol01.png" and "Organisation_SessionName_UserId_DDMMYYYY.Protocol02.png". All original files and the protocol text file are to be stored into a subfolder named "Protocol". The protocol also is to give an additional context description of the user session, e.g. what are the instructions, what is the goal, who is carrying out the test, what is the setting.

All user-produced sketches, drawings and built props are to be photographed or scanned and stored in the PNG file format with a resolution of a minimum of 2480x3508 pixel (A4 scan at 300dpi). All files are to be named incrementing as follows: "Organisation_SessionName_UserId_DDMMYYYY.Sketch01.png" and stored into a subfolder named "Sketches". The protocol is to reference each document by name, and give a short description of the content in the context of the user session.

All screenshots, screen casts, photos, video and audio recordings documenting the user session are to be stored into a subfolder named "Documentation". All images and photos are to be stored in the PNG file format with a minimum resolution of 1024x768 pixel, All audio recordings in the MP3 file format with a data rate of at least 128 kbit/s, all video recordings in the MP4 h.264 file format with a minimum resolution of 1280x720 pixel and a data rate of at least 5000 kbit/s and a frame rate of at least 24 fps. All files are to be named incrementing as follows: "Organisation_SessionName_UserId_DDMMYYYY.Screenshot01.png", or "Organisation_SessionName_UserId_DDMMYYYY.VideoHands01.mp4". The protocol is to reference each document by name, and give a short description of the content in the context of the user session.

All original digital files produced by the user during a user session, e.g. project files, produced music in form of symbolic data or audio are to be stored into a subfolder named "Content". The file naming is to be taken directly over from the user's naming, however with taking care to anonymise the data.

All data is to be stored in a tree-like folder structure, organized by organization, user session, and finally user per session.

Additional database-dependent search functionality apart from search features provided by standard operating systems (full-text search on the protocol and the file names) will be implemented centrally by JCP-Consult on an "as-needed" basis.

4.5   Experiment and Result Reporting

Apart from documenting all user sessions as previously described, the results from the user sessions are also to be reported in a number of ways:

1. Internal event reports in a reasonable timeframe after the event,

2. updates on the project website, and finally

3. as a part of the annual work package activity reports.

Each of the reports is to contain basic statistic data of the reported about events, and an interpretation as evaluation of the results. As results from WP2, in whose context the user sessions are carried out are to feed development in the work packages 3, 4, and 5, each of the reports is to contain a "Relevance" section divided by work package, reporting outcomes that are of interest to this work package. Each of the reports is also to contain a perspective into respective future activities, i.e. when the next sessions with a group of longitudinal users are scheduled and what is intended to test.

5   Conclusions

The purpose of this document is to create a shared set of methodologies and criteria to execute and evaluate user involvement within the GiantSteps project. It is envisioned as a guide as to how the consortium approaches user participation, and contains as much detail as possible on the consortiums intentions for the different types of user involvement. Both the expert and non-expert experience of computer-based music performance and production remains the central concern of the project, and this document is designed to reflect that.

This document should be used as a guide to direct researchers and designers as they proceed within the project through user participation, but in an equally important way, this document serves to facilitate an on-going cross-consortium conversation as to how and to what purpose the user involving aspects of the project are conducted.

The consortium's working method of producing ideas and prototypes, engaging with users, and constructing the underlying technological frameworks that enable the building of novel user interfaces is designed to follow a cyclical process, and this document is also part of how this manifests itself within the consortium. To reflect the cyclical aspect of our working method, we will assess how this document should be modified and extended, and the document itself will be revisited in the form of D2.3.

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A   Appendix

A.1.   Workshop Participation Consent Form

WORKSHOP PARTICIPANT CONSENT FORM

Project Name: GiantSteps

Workshop leader: Kristina Andersen (example)

Workshop date: 27th May 2014 (example)

Location: STEIM, Amsterdam, NL (example)

- I understand and agree to take part in this workshop.

- I understand that I may withdraw from the workshop at any stage and that this will not affect my status now or in the future.

- I understand that while information recorded during the workshop may be published, I will not be identified and my personal details will remain confidential. I understand that I will not be identified by name in any published materials.

- I understand that I may be photographed or videotaped during the workshop.

- I understand that data will be stored electronically and that authorised staff associated with the project may have access to all materials.

- I understand that I may contact the workshop leader if I require further information about the project, or I wish to withdraw my consent.

- I understand that the results of this workshop may be published in project reports, academic conferences and journals, the project website and/or book chapters.

Signed …………………………………..

(workshop participant, or parent/guardian)

Print name ………………………………

User reference …………………………

Date ……………………………………

Contact details:

Workshop Leader: Kristina Andersen, kristina@steim.nl (example)

B Appendix

B.1. Project Information Sheet

PROJECT INFORMATION SHEET

THIS INFORMATION SHEET IS FOR YOU TO KEEP.

Project Name: GiantSteps

What is the purpose and aim of the project?

The GiantSteps project aims to create musical tools that provide intuitive and meaningful interfaces to complex selections of sounds and musical data through music expert agents, music analysis algorithms and new interface paradigms. The project consortium will employ a participatory design process to not only develop and test requirements for novel interfaces to music performance and production, but also to gain a better understanding of how musicians "see" their music, how its information can be conceptualised, and how that may inform the consortium's approach to Music Information Retrieval and building interfaces for creative musical expression.

Which organisations are involved in the overall project?

The GiantSteps project is a collaboration between music research institutions (Universitat Pompeu Fabra Barcelona, ES, Johannes Kepler Universität Linz, AT), manufacturers of software and hardware for music production and performance and R&D companies (Native Instruments, Berlin, DE, Reactable, Barcelona, ES, JCP-Consult, Paris, FR), and music practitioners (STEIM, Amsterdam, NL, Red Bull Music Academy, Cologne, DE) funded by the European Union through the 7th Framework.

What are the possible outcomes and benefits of the project?

Possible benefits from this project are novel and more intuitive interfaces to the creative working with music and sound. Other benefits might include a transformation of the way we think about workflows and musical structure.

Why have you been chosen to participate?

You were approached, and have been chosen to participate as you have relevant music and performance expertise, or expertise in the area of creative or interactive technologies, and expressed an interest in participating.

What will this specific workshop/session involve?

You will be asked to answer a short questionnaire, participate in a number of short exercises involving talking about sound and music, drawing and making models of ideas and in some cases playing together with other participants.

How much time will it take?

An individual session will take 2-4 hours, you may be asked to participate in multiple sessions.

Inconvenience or discomfort

It is not anticipated that you will experience any inconvenience or discomfort.

Payment

You will not be paid for your participation.

Withdrawal

You can withdraw at any stage of the project, and your data can be withdrawn at any stage prior to publication, without you being penalised or disadvantaged in any way.

Confidentiality.

The information collected with your assistance will be kept confidential. Resulting images, video and audio material of you will be edited for use, and things you have said may also be quoted or paraphrased, as agreed in the signed consent form, for the dissemination of this research. In all cases your contribution will be credited accordingly.

Storage of data.

All collected user test data is to be stored encrypted on hard drives locked away in a secure storage place at the organization where the user test was conducted, and additionally a second copy of all data is to be stored centrally on an encrypted server-space, contact: Dr. Joost Geurts.

Potential publication.

The results of the research will be published on project website; in academic conferences and journals; and in book chapters. Results will also be published as public presentation and talks in a range of contexts.

If you would like further information about any aspect of this study, please contact the workshop leader: Kristina Andersen, kristina@steim.nl (example)

If you have a complaint concerning the manner in which this research is being conducted, please contact: Dr. Joost Geurts.

Thank you for participating!

The GiantSteps consortium

C Appendix

C.1. Children's Workshop Initial Questionnaire

WORKSHOP PARTICIPANT QUESTIONNAIRE (example)

Project Name: GiantSteps

Workshop leader: Kristina Andersen

Workshop date: 16th March 2014

Location: STEIM, Achtergracht 19, Amsterdam, NL

Page 1/1

User Reference Number:

How old are you?

Do you play an instrument? Which?

Have you ever done any music lessons? What kind?

Do you use computers? What do you use them for?

What kind of music do you like?

How do you think that new instruments are invented?