FolkArtiNet: Folk music groups: their artistic practice and infrastructural needs in the COVID-19 era and beyond

Research Report

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DARIAH-PL MIR Working Group

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1. Introduction and Motivation

As the global COVID-19 pandemic forced the world to self-isolate, we fully realized how crucial information and communication technologies (ICT) are for performing our everyday life activities, i.e. allowing for remote work and study, remote access to key public services such as health, administration and finance, remote access to culture and entertainment including artistic performances. What we did not know was to what extent the pandemic situation affected the artistic practice in terms of building the repertoire, organizing rehearsals and concerts, disseminating events, and whether there were services or digital tools that could specifically support artists in their work. **We therefore set up as the main goal of the project to identify infrastructural requirements of selected artistic groups and, as a result, to provide re-usable research methodology and workflow for gathering infrastructural requirements.**

The project was conducted by the DARIAH-PL Music Information Research Working Group (MIR WG) which has been working on creating a virtual environment that supports ethnomusicological research. MIR WG's work has been centred around the largest archive of Polish traditional music held by the Institute of Art of the Polish Academy of Sciences (IAPAS) and its strong links with local, regional and national communities involved in preserving and cultivating musical traditions of Polish ethnographic regions. **Hence, in this project, we focused specifically on folk music practitioners and their requirements in regard to using digital technologies in their artistic practice. Our objective was to investigate, understand and determine whether currently available tools and infrastructures can address those requirements or whether new tools and services should be developed.**

Based on the preliminary research and interviews, prior to the beginning of the project, we have identified four main areas in which folk music practitioners may interact with or rely on digital infrastructures related to cultural heritage: 1) building a repertoire, 2) reliable online communication between group members, including remote rehearsals, 3) storing and sharing data, and 4) art and music events dissemination. The information on infrastructural requirements of folk music artists was obtained through a series of interviews with selected folk ensembles and an online survey directed to a wider folk music community followed by a workshop. The aim of the workshop was to discuss the project results with folk practitioners and to demonstrate technical solutions already available for the use by the community.

The report is structured as follows. In Section 2, we provide a brief characteristics of the Polish folk music groups, which is relevant in the context of our study. Research methodology is described in Section 3 together with workflow presentation. The results of interviews and survey data analysis are presented for each area of the groups' activities in Section 4. Section 5 describes the workshop, its organization and results. We conclude the report with a summary of our findings in Section 6.

2. Polish Folk Music Groups

Poland is a country located in Central Europe, with an area that covers 312,696 square kilometres and a population of nearly 38.5 million people. It is divided into 16 administrative provinces, roughly corresponding to geophysical regions that are also culturally distinct. Poland's topographically diverse territory extends from the Baltic Sea in the north to the Sudetes and Carpathian Mountains in the south. The country is bordered by Lithuania and Kaliningrad Oblast of Russia to the northeast, Belarus and Ukraine to the east, Slovakia and the Czech Republic to the south, and Germany to the west. Throughout the history, Poland experienced multiple territorial and administrative changes. At the time when Poland lost its independence, traditional music and dance allowed the inhabitants of the countryside to preserve their identity. All these factors influenced Polish traditional culture. As a result, Polish folklore is a diverse and rich cultural phenomenon that represents a variety of ethnographic and ethnic groups inhabiting both present and historical Polish regions. It was first extensively documented in the second half of the 19th century by an ethnographer Oskar Kolberg (1814-1890).

To this day, across Poland and abroad, there exists a multitude of folklore groups including folk bands, vocal ensembles, folk song and dance groups. Their provenance and motivation vary depending on geographical location and modus operandi. On one end of the spectrum, at a local community level, there are practitioners that simply follow their own family traditions or engage in artistic activities run by local and regional culture centres. On the other end, there are professional folk bands and dance groups who perform worldwide and earn this way their living. In the middle of the spectrum, one finds amateur and semi-professional groups operating in larger cities whose members often originate from urban areas but have a strong need to rediscover their roots and identity. There are also groups of enthusiasts who rediscover the rural musical tradition, record the last authentic performers and aspire to perform traditional music *in crudo* within the so-called revival trend. The need to cultivate traditions brought from the homeland is especially strong across Polish expat communities located all over the world. It led to establishing various folklore organizations outside Poland, e.g. The Federation of Polish Folklore Groups in Great Britain [1] and The Polish Folk Dance Association of the Americas [2].

The existence of so many folk groups in Poland would not be possible without institutions that perform administrative and financial supervision, pay for rehearsal halls, costumes, artistic tours and organize events. These institutions include numerous regional cultural centres in villages, small towns and bigger cities, schools and universities that finance traditional music and dance ensembles. There are more than few hundreds folk ensembles active in Poland. They perform at local and national events and represent Poland at international festivals. The fact that the ensembles receive regular financial support enables them to function as a strong artistic community. The financial situation of the groups active abroad is different. They may receive some support from Poland however it is not provided on a regular basis. Many rely on membership fees for their subsistence and on local Polish communities to provide rehearsal venues.

3. Methodology and Research Workflow

This Section presents the methodology for obtaining and processing information regarding the needs of folk music groups in the field of information technologies. It concentrates exclusively on groups cultivating Polish folk music tradition, however, due to the reasons presented below, this methodology can be adopted for similar groups in other countries.

At first, the COVID-19 era gave us the impulse to examine whether folk groups are aware of existing Networked Music Performance systems that support practicing music remotely in real time. However, the scope of the research has become much larger and concerns all possible ICT means that can support folk groups as the guardians of intangible heritage of Polish dance and music. In this sense, the study did not have thematic limits and was open to all possible findings. We focused on a specific artistic community of folk music and dance groups loving to perform traditional music that meets their sentimental and social needs. This community is instrumental in raising awareness of the need for national intangible heritage preservation. Many groups, often consisting of elder people living in small towns and villages, are not aware of ICT solutions that could help them in their artistic practice. Therefore, we wanted to get acquainted with these groups as potential end-users of the specialized IT solutions that could be tailored according to their needs. In the semi-structured interviews and surveys, we asked the groups about their everyday practice and potential infrastructural needs, and in the same time, we helped building their awareness of the ICT tools that might be useful in their artistic activities.

3.1. Interview and Survey Construction

After the extensive Internet search, we have identified several hundred active Polish folk groups. To find potential responders for online survey, we used available online databases of Polish folk groups that provide email addresses, Facebook profiles and group websites. For online interview, we first selected one internationally recognized folklore group to informally discuss their practice and discover basic

problems related to the use of technology in their artistic work with folk musicians and dancers. As a result, we got familiar with the problems of the daily practice and needs of this particular community. This enabled us to prepare the questions to be asked during the online interviews. We could not interview all numerous groups, therefore, we selected those which were recognized for their strict adherence to traditions.

We talked to artistic directors as they were most influential on how the tradition was reconstructed, preserved and cultivated. We asked how they did research on source materials and used their network of contacts for consultations. To structure the conversation, they filled in a preliminary questionnaire to get familiar with the discussion topics before the meeting. The interviews were recorded, automatically transcribed and processed to extract the key findings related to:

- discovery of source materials for building repertoire,
- remote interaction and communication between group members,
- storing and sharing data necessary to maintain the artistic workflow,
- art and music events dissemination,
- preservation and curation of reconstructed customs.

This enabled us to finally structure the online survey addressed to Polish folk groups all over the world at the next step of the project. The final stage of the research was an online workshop the aim of which was to summarize the knowledge gathered, promote technical solutions already available and create a focus group that will foster future collaboration within techno-folkloristic community. To summarize, a combination of quantitative and qualitative approach (in-depth interviews and survey results) was used to identify key infrastructural needs and requirements of the folk groups.

3.2. Interview and Survey Structure

Based on the knowledge gained during the introductory conversation with selected group leaders, we improved the survey questions concerning identified areas of artistic activities. The survey questions are either multiple choice with a textbox for a complementary answer or open questions to write down broader thoughts. The questions are grouped into the following six topics:

- **Section A. General information** – to gather the artistic and social context in which the group operates,
- **Section B. Repertoire** – to discover IT solutions that support or could support repertoire creation (music, dance, costumes, props, rites),
- **Section C. Cooperation between the group members** – to identify technologies that facilitate collaboration,
- **Section D. Data storage and sharing** – to gather information on technologies that could support documentation of the group's work and achievements,
- **Section E. Artistic events** – to determine to what extent new technologies impact promotion of artistic activities,
- **Section F. Looking to the future** – to imagine and facilitate brain-storming on what technologies, solutions, applications folk artists would benefit from.

Section A. includes questions aimed at obtaining information about the artistic and social context in which groups operate. Individual elements of this context allow for interpretation and understanding the groups' needs in terms of IT solutions. The character of the group determines the type of source materials they use. For example, choreography is of interest to dance groups but not necessarily to folk bands. Regional groups typically want to faithfully recreate local traditions. An amateur group may use different types of

materials or tools than a professional group or a group working with professional instructors. For example, amateur artists may not have the choreographic training required to use specialized software. A tool that offers a more illustrative presentation of various dance routines can be of help. The "structure" of a group determines the influence individual members have on the activities of the entire group.

Section B. The purpose of the questions in this section is to find out what ICT solutions can support group's repertoire creation. The questions are either indirect and concern repertoire creation or direct and concern ICT solutions used in the process.

Section C. The questions in this Section relate directly to technologies that facilitate or may facilitate collaboration between group members. We asked explicitly about communication channels used, organization of remote rehearsals and performances. We wanted to know, if the group is aware of the existence of new tools for music networking.

Section D. The purpose of this Section is to inquire about technologies used for archiving the group's work and achievements. In particular, we wanted to know what kind of resources related to the activities of the group are digitally stored, where and in what form they are stored and who can access them. This is a crucial part of the survey as it may guide the future development of systems supporting preservation of artefacts and documentation gathered throughout the years.

Section E. Performances of the folklore groups are of special value, as they play an educational role in the society and become part of the heritage. Therefore, the crucial problem tackled in this Section concerns determining to what extent new technologies affect and potentially have an impact on the promotion of groups' artistic activities. In particular, we wanted to know what digital systems for live streaming they are aware of and what conditions must be met to make broadcast over the Internet possible.

Section F. The purpose of this Section is facilitate brainstorming on what technologies, solutions and applications folk artists would benefit from. In particular, we wanted to know how familiar they are with the existing solutions and those being currently developed.

3.3. Data Processing and Analysis

The data collected from the interviews and their automatic transcription were first subjected to general analysis to find out the most interesting issues raised, and then, together with survey results, to the thematic analysis. The data was also used in a workshop planning as a basis for selecting technological solutions that may be of interest to the community and constitute topics for discussion.

3.4. Workshop Organization

The purpose of the workshop was twofold: (i) to expose artists to some technological solutions that may support their activities, and (ii) to facilitate discussion and sharing experience on the artists' requirements

towards such solutions. The workshop was organized online for Polish folk music community members. It consisted of a demo session and panel discussions. We have demonstrated solutions in three areas: (i) search for folk music and music-related content with Europeana cultural heritage aggregator, (ii) content management, archiving and sharing with cloud-based repository platform LoCloud, and (iii) online rehearsals with SonoBus software.

3.5. Research Workflow

This Section summarizes the steps undertaken in the current research in a table that enables our potential followers to acquire the proposed methodology easily. We assume that the team undertaking similar research has basic knowledge about the folk music tradition in a given country. The study should be conducted both on representatives of key, well-known groups and on a relatively large community of various smaller folk groups that are potential end-users of the technological solutions. The proposed sequence of actions is presented in Table 1.

Table 1 Study workflow

Step	Activity	Means	Expected outcome	Remarks
1.	Meetings of the research group to discuss the project workflow and to decide on the thematic areas that should be investigated both in interviews with artists and in surveys.	Remotely or face-to-face	The draft version of questions for the interviews/survey	
2.	Gathering contact information about folk groups operating in the country and abroad.	The Internet search	Email contact list for further use	For this project: https://zespolyludowe.pl/ https://www.polishfolkloregroups.co.uk/ https://www.pfdaa.org/
3.	Finding a prominent, experienced folk group to informally discuss the project goals and research methods	Face-to-face (remotely if for certain reasons meeting in person is impossible)	1. Examining first opinions and willingness to take part in the study 2. Gathering initial information concerning common practices in artistic activities of the group 3. Formulating specific questions for an interview	For this project: Folk Dance Group "Poligrodzianie"
4.	Identifying criteria for selecting other folk groups to be interviewed	Internet research, a discussion with the selected prominent folk group	Groups selected according to the following criteria: • groups operating in various regions of Poland • expat groups	For this project: • Folk Dance Group "Poligrodzianie", • Folk Dance Group "Szamotuły",

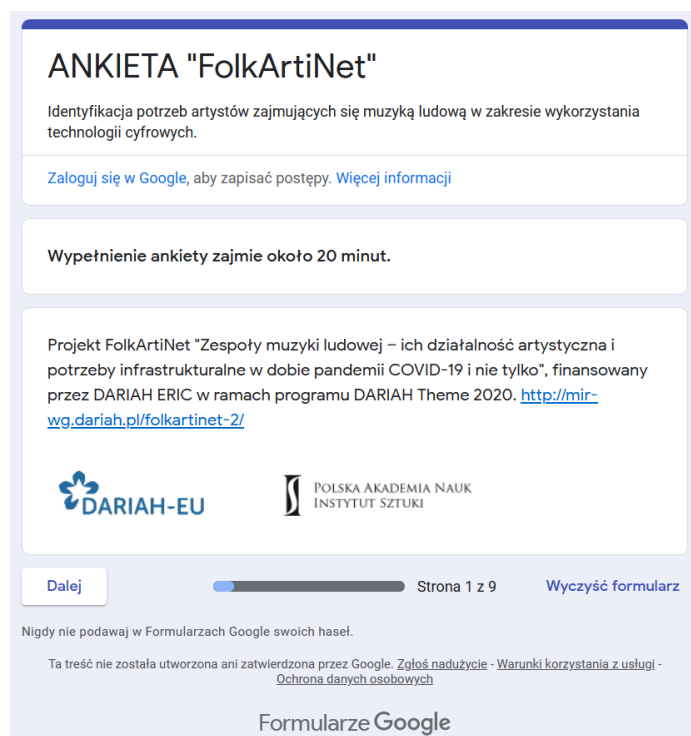|				
			• semi-professional groups and native groups • urban vs. rural	• Folk Song and Dance Group "Ziemia Żywiecka", • Folk band "Janusz Prusinowski Kompania", • Polish Folk Song and Dance Group "Tatry" (London)
5.	Circulating an initial questionnaire among groups selected for the interview to prepare them for the discussion.	Sending and receiving the filled in questionnaire via email	Groups to be interviewed get acquainted with the kind of information expected from them in the interview.	This step is very important, as the result, the interviewees are not surprised during the interview and their answers are more reliable.
6.	Analysis of the questionnaire answers received	Filled questionnaires	Researchers get preliminary information from groups and may prepare clarifying questions to be asked during the interview	also very important step
7.	Conducting semi-structured interviews	Remotely (ICT means) Participants: 1) artistic director of a folk group (+ choreographer if needed) 2) full research team, Filled in questionnaire displayed on the screen as a reference	1. Discovery of the artistic practice of the groups, 2. Discovery of the ICT infrastructure used 3. Probing groups' awareness of the existing IT solutions 4. Introductory presentation of possible IT solutions to be used for practicing and for the archiving purposes	
8.	Automatic speech-to-text transcription and translation of the recorded interviews	Automatic Speech Recognition and Automatic Speech-to-Text Translation Tools	Interviews transcripts ready for further processing	Additional manual corrections of the transcripts
9.	Analysis of the interviews by researchers to identify main issues worth further attention	Interviews' transcripts	Identifying themes to be further analyzed manually and digitally	

10.	Final adaptation of the survey questions based on the interviews to be send to multiple folk groups	Google survey	Discovery of new specific issues related to the use of ICT technologies in artistic practices	
11.	Conducting Internet surveys	As above	As above	
12.	Survey answers analysis	Google forms statistical output	Quantitative analysis of survey responses	
13.	Formulating conclusions from interviews and survey.	Discussion among research group	Writing a report, formulating program of the workshop	
14.	Disseminating results over the Internet	Project webpage	Collecting feedback	
15.	Preparing demos, presentations and panel discussions for the workshop			
16.	Inviting panelists from the interviewed/ surveyed folk groups	Existing contacts (email)		
17.	Running & recording the workshop	Remotely		
18.	Automatic speech-to-text transcription and translation of workshop panel discussion	Automatic Speech Recognition and Automatic Speech-to-Text Translation Tools	Verification of the folk groups' needs	
19.	Formulating final conclusions and future steps towards applying technology in everyday practice.	Dissemination via the Internet	Preparing plans for the next project	

3.6. Methodology Implementation Tools

The following tools were used to implement the methodology:

- all interviews were conducted remotely and recorded using the Cisco Webex platform,
- interview and panel discussion transcripts were generated with ARM-1 NG – an automatic speech recognition engine developed by Poznan Supercomputing and Networking Center,
- transcript post processing was performed with tools developed by Poznan Supercomputing and Networking Center and CLARIN-PL tools,

- manual transcript correction was performed with Subtitle Edit,
- the online survey was implemented with Google Forms,
- text translation into English was supported by DeepL translator,
- the workshop was conducted and recorded using the Cisco Webex platform.

Figure 1 Online survey snapshot

4. Interviews and Survey Data Analysis

In this Section we provide analysis of data collected during the interviews and with online survey for each area of the groups' activities. The results overview is followed by a list of technological requirements identified based on the collected data and our knowledge of the available technological solutions and prioritized with MoSCoW technique.

Since we could not interview all numerous groups, we selected five groups amongst those that were recognized for their strict adherence to inherited traditions: Folk Dance Ensemble "Poligrodzianie", Folk Dance Group "Szamotuły", Folk Song and Dance Group "Ziemia Żywiecka", "Janusz Prusinowski Kompania" Band, Polish Folk Song and Dance Group "Tatry".

"Poligrodzianie"   "Szamotuły"   "Ziemia Żywiecka"

"Janusz Prusinowski Kompania"   "Tatry"

Figure 2 Folk ensembles invited for interview

In addition to the data collected from the five interviewed ensembles, we sent personal invitations to take part in the online survey to 199 folk groups operating in Poland and abroad. We received filled in questionnaires from 31 ensembles. This gave us 36 survey responses in total.

4.1. Results

Section A. General Information

This Section includes questions aimed at obtaining information about the artistic and social context in which groups operate. Individual elements of this context allow for interpretation and understanding the groups' needs in terms of IT solutions. The character of the group determines the type of source materials they use. For example, choreography is of interest to dance groups but not necessarily to folk bands. Regional groups typically want to faithfully recreate tradition. An amateur group may use different types of materials or tools than a professional group or group working with professional artists. For example, amateur artists may not have the choreographic training required to use specialized software. A tool that offers a more illustrative presentation of various dance routines can be of help. The "structure" of a group determines the influence individual members have on the activities of the entire group.

1. Name of your ensemble

2. How do you define your ensemble's type?

Half of the survey respondents described themselves as a folk song and dance ensemble. Further two most popular categories were regional ensemble (16.7%) and folklore ensemble (16.7%), followed by three other *ex aequo* categories (5.6%): singing group, folk band, contemporary works inspired by folk art.
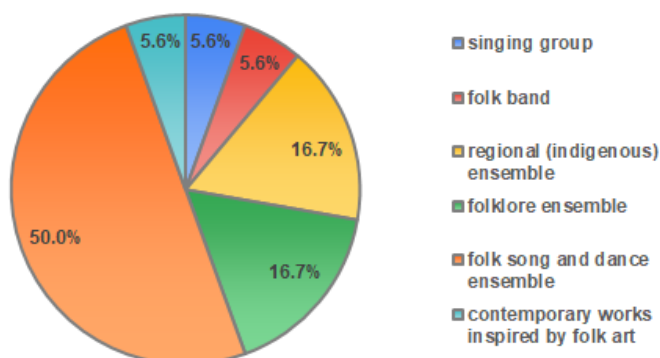

Figure 3 Polish folk ensemble types

3. How many members does your ensemble have?

As far as the size of the ensemble is concerned, there are considerable differences between the groups. The declared number of members ranged between 5 and 600 people resulting in the ensemble's size of 70 people on average. The largest folk music and dance ensembles are often divided into smaller age-related subgroups that have both repertoire and dance instruction tailored to their capabilities.

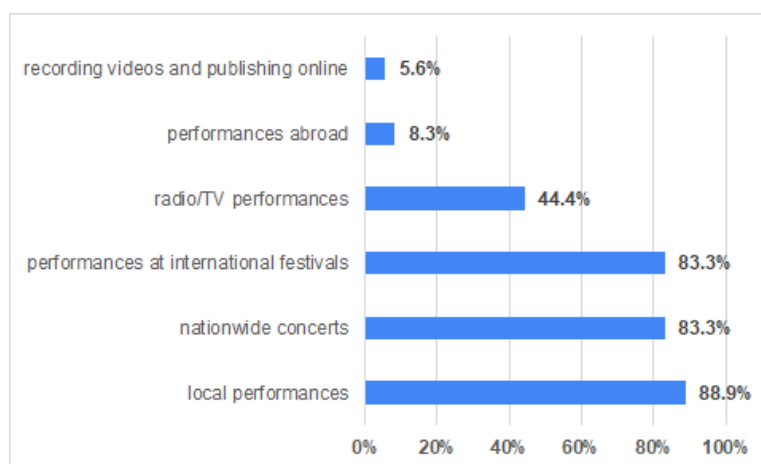**4. What is the age range of your ensemble members?**

The age range of ensemble members can be directly related to the group's size and its organizational structure. The respondents reported to have as young members as 3 years old up to seniors of 87 years of age, with an average member being 52 years old.

5. How old is your ensemble?

In terms of the groups' "longevity", the differences are substantial. Some ensembles have been existing for more than a century, others have just started performing. Reported years of groups' activity ranged between 1 and 120 years, on average 34 years.

6. What is your ensemble's area of influence? Where do you perform?

Most of the groups perform locally and nationwide (88.9% and 83.3% respectively) with 83.3% also performing at international festivals organised both in Poland and abroad. Up to 44.4% of concerts are presented over radio and TV broadcasts. While those numbers mainly concern live performances held in concert venues, there was also a new "Other" category proposed, reflecting groups' digital presence on the Internet and social media: "recording videos and publishing online".

Figure 4 Polish folk ensembles. The scope of performing activities.

7. Is working as a musician/dancer/choreographer the main source of income for your ensemble members? What is the character of your ensemble?

Within the collected responses, the vast majority (80.6%) are amateur ensembles, i.e. their members get involved in the group's activities in their private time, as a hobby. Only 13.9% groups hire professional staff such as a manager, choreographer, dance instructor, for whom working for the ensemble is a source of income. Few ensembles (this generally applies to folk bands) make a living from playing (5.6%).
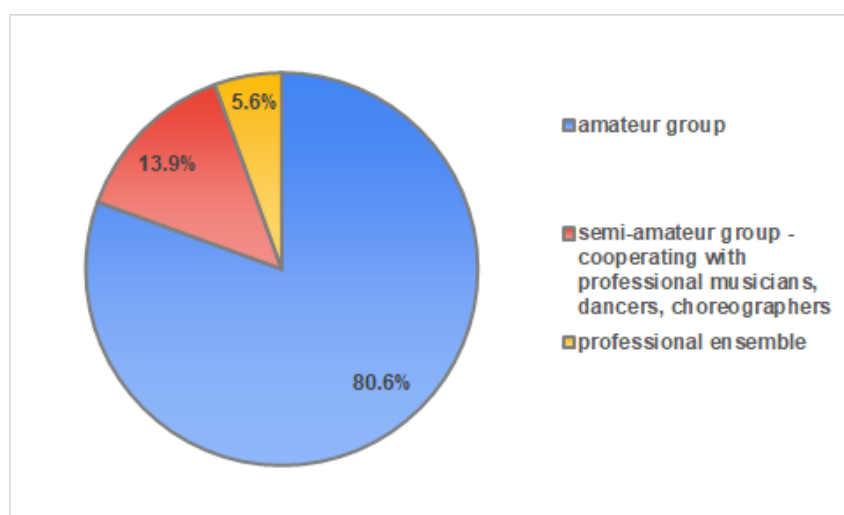
Figure 5 Polish folk ensembles. The modes of subsistence.

8. Who makes decisions concerning your ensemble's activities?

By asking this question, we wanted to find out who is involved in the decision making process, whether the main decisions are only up to individuals (managers, artistic directors) or whether these decisions are made on more democratic terms, i.e. taking into account opinions of the group members. As Figure 6 shows, for 44.4% of the groups decision making power stays with their manager (who very often is also the group's artistic director), for 22.2% it is a management board or a committee of elected members who decides on the group's existence, in 16.7% cases decisions are taken fully democratically by all members, followed by the groups for which their funding institution is the main stakeholder (11.1%).
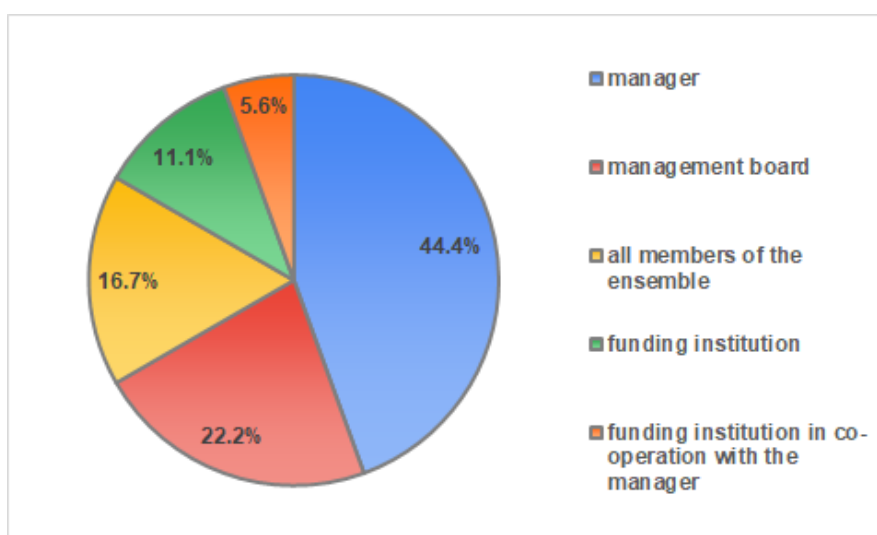

Figure 6 Polish folk ensembles. Decision making process.

9. Which (IT) technologies/applications/programs do you use in your ensemble's activities?

Amongst the respondents, software for editing sheet music (e.g. Finale, Sibelius, MuseScore) was the most popular category (41.7%), followed up (22.2%) by software for post-production of rehearsal/performance recordings (e.g. Protools, Logic Pro, Cubase, Ableton, DaVinci Resolve, HitFilm Express, iMovie, Lightworks), and OMR software (13.9%) for recognising musical notation from scans and pdf files (e.g. ScanScore, PlayScore, Photoscore, SmartScore). Few groups (8.3%) reported using tools for automatic audio transcription (e.g. ScoreCloud, Transcribe!, AudioScore Lite, Tunepal) and software for creating choreography such as Dance Designer (2.8%).
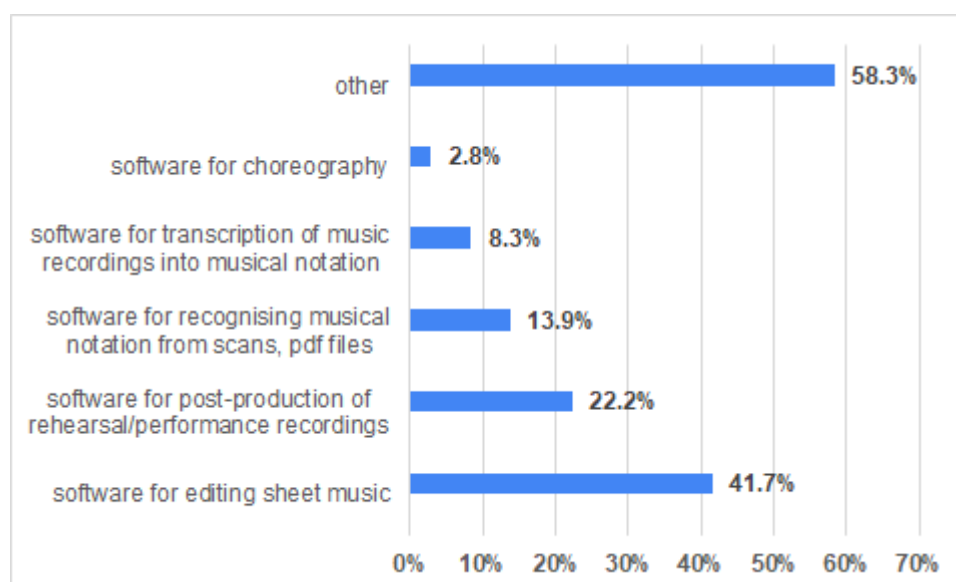
Figure 7 Polish folk ensembles. Types of software used.

In the aggregated "Other" category, the answers included:

- we do not use any (5)
- Facebook (4)
- Instagram (3)
- Websites (2)
- YouTube (2)
- iCloud for data archiving (2)
- video editing software (various)
- Google Calendar, Google Drive, Outlook
- simple programs for recording video and sound on mobile phones.

Section B. Repertoire

The purpose of the questions in this Section is to find out what ICT solutions can support group's repertoire creation. The questions are either indirect and concern repertoire creation or direct and concern ICT solutions used in the process.

1. Who selects your ensemble's repertoire?

In most cases, the repertoire is selected by the artistic director of the group. This option has been indicated by 88.9% respondents. In two cases, the impact on the repertoire choice has been attributed to the group's manager. In 5.6% cases, the manager is supported by choreographers and instructors, and, as in case of expat groups and folk bands (16,7%), by group members. When the group is financially supported by local administration authorities, these administrators have also the impact on the repertoire decisions. In one case, the impact on the repertoire has been attributed to the group's management board.
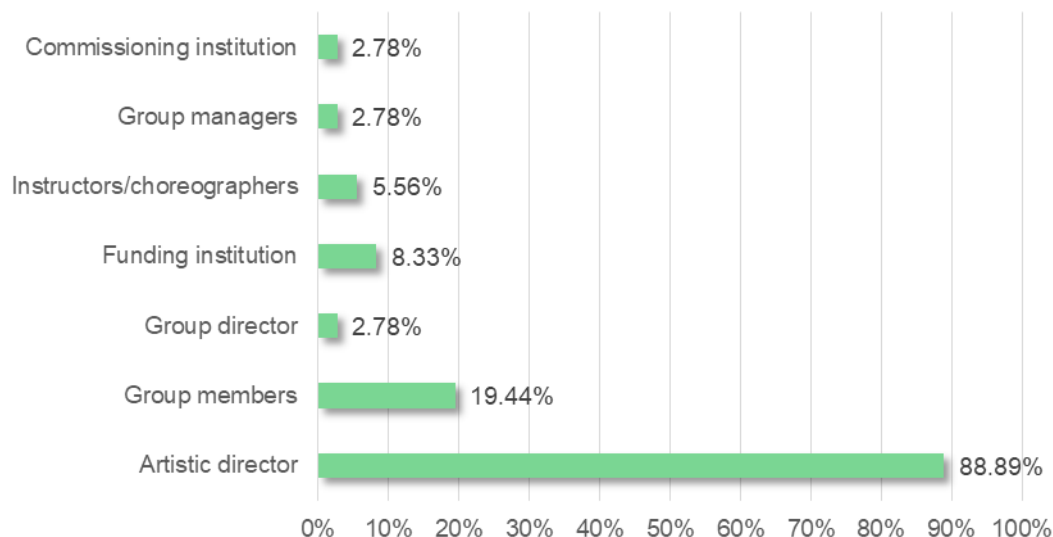
Figure 8 Repertoire selection

2. Who creates/develops your ensemble's repertoire (music, choreography, costumes)?

In most cases, the repertoire development relies on artistic directors (77.8%). Sometimes (22.2%), they are supported by selected group members (e.g., in expat and native groups). In certain instances, professional instructors, choreographers or musicians support the artistic directors in creating the repertoire. Expat groups often rely on choreographers from Poland and use material learned during courses in Poland. There are cases when all group members shape the repertoire. It mainly concerns folk bands and native regional groups.
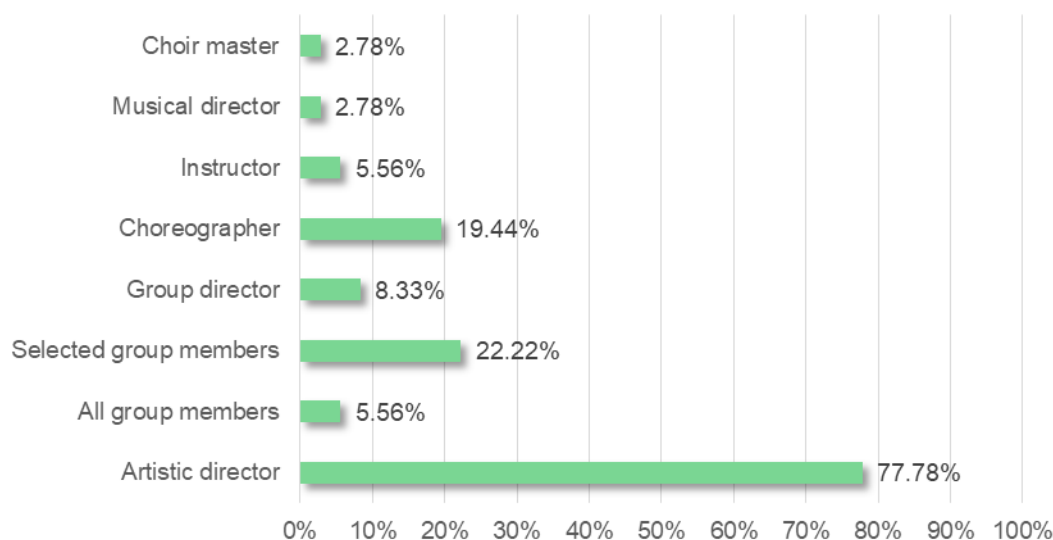

*Figure 9 Repertoire creators*

3. What does your ensemble's repertoire consist of ?

The most common elements of all groups' repertoire are regional songs and dances (100% answers), often staged as traditional rites such as wedding, spring welcoming, etc. (61.1%). Almost all surveyed groups have national songs and dances in their repertoire (55.6%), whereas having songs and dances from other

nations was declared by 11.1% of the groups, and from other regions by 2.8%. One group reported that they also perform contemporary miniatures inspired by folklore.
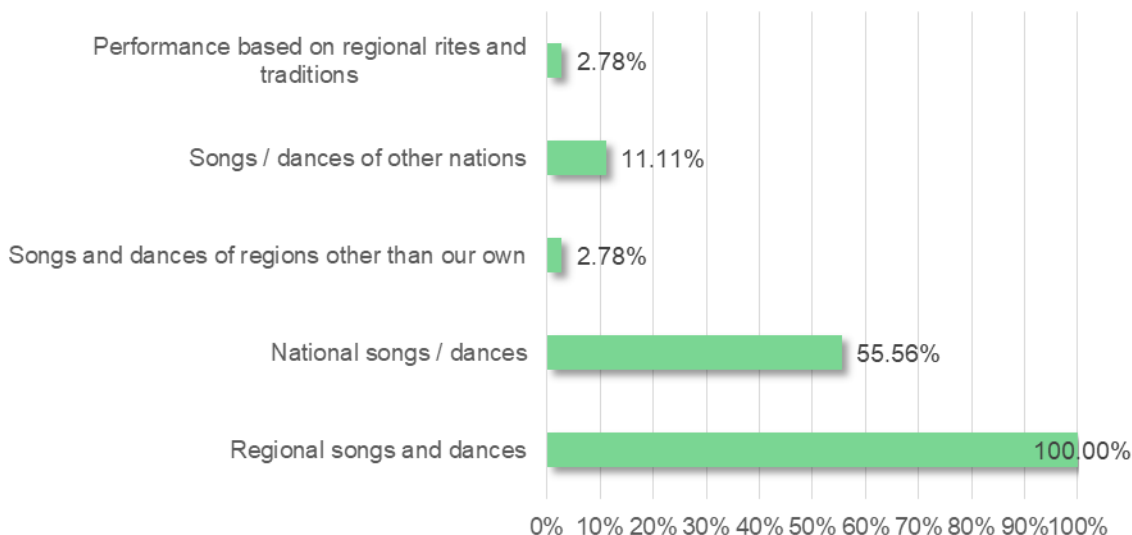

Figure 10 Ensemble's repertoire elements

4. What resources are used to create your ensemble 's repertoire?

The groups indicated the following main sources for their repertoire:

- songs from songbooks (91.7%),
- intergenerational transmission (80.6%),
- music and dances learned during courses and workshops (47.2%, mainly expat groups).

The native groups also perform compositions created by their members (33.3%). Some groups perform the repertoire borrowed from other groups (19.4%). The least popular source of repertoire is the Internet where filmed performances of other groups may be found (2.8%).
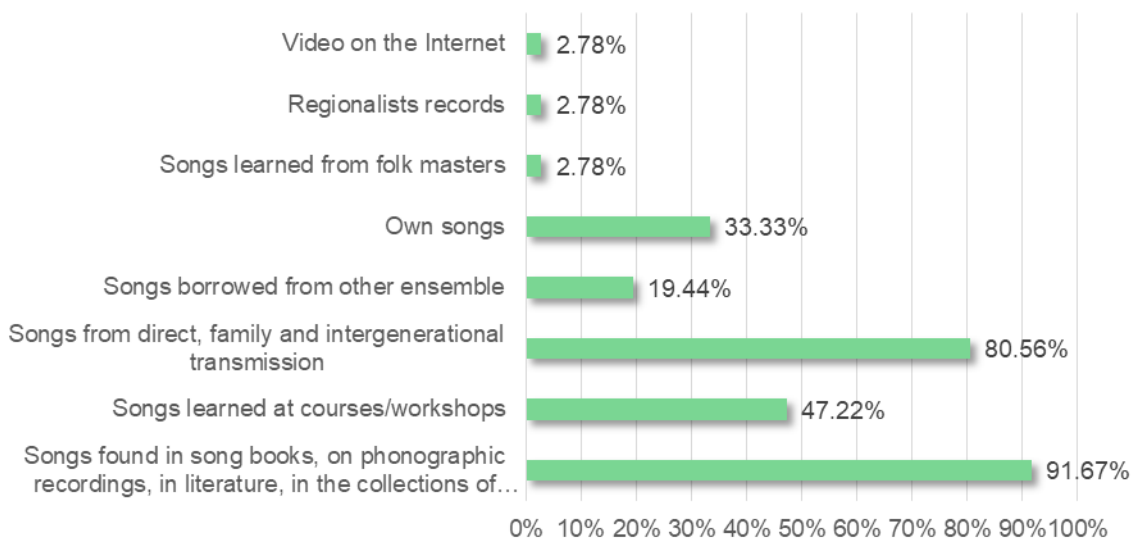
Figure 11 Repertoire sources

5. Where do you find source materials (music scores, audio, video, photos, graphics) for music and choreography?

At least until recently, the most extraordinary "reservoirs" of folk music traditions and customs were old dancers and musicians. Whenever possible, they are consulted by artistic directors on how particular tunes and dances should be executed.

"But that was also not what one person told me, I treated it as a canon that was in force, no. There were always a few who had to confirm to me that you danced this way, that you sang this way."

The quotation comes from the survey filled by the artistic director of "Szamotuły" folkloristic group. If possible, groups profit from the intergenerational oral transmission and their own sources gathered during years of the ensemble existence. One regional group reported that they use local cultural centre archives and perform their own field studies.

In most cases, the group leaders put a lot of effort into making the costumes, repertoire and preparing performances as close as possible to the real tradition. Hence, field studies, consultations with old folk performers and regionalists, as well as studies on the collections of regional museums are carried out. Where it is possible, songs from direct family intergenerational transmission are included in the repertoire.

In a nutshell, the following sources are used for developing the groups' repertoire:

- intergenerational transmission (86.1%),
- ethnographic literature (72.2%),
- songbooks (72.2%),
- search engines, e.g. Google (44%),
- collections of the Institute of Art of the Polish Academy of Sciences and others cultural institutions (36.1%),
- websites / social networks of other ensembles (33.3%),
- websites promoting folklore art, e.g. Radio Centre of Folk Culture (27.8%),
- websites promoting traditional music, e.g. zespolyludowe.pl (19.4%),
- digital libraries, e.g. POLONA (11.1%),
- learned from folk masters (2.8%).

6. What are the search criteria for the sources listed in response to Question 5?

For most folk groups (97.2%), all the searched material had to be linked to a specific region and for further 66.7% to a specific theme, e.g. occasion, festivity, custom, that can be adapted for dancers of different ages. Also melodic/instrumental criteria are very important for source materials search (36.1%). Sometimes, when more complex performance of a traditional rite is prepared, many various sources are used. The survey provided interesting individual statements characterizing different approaches to selecting the repertoire. Long existing groups return to their past performances that have not been staged for years. When financial and storage capabilities of an ensemble are limited, the repertoire is chosen in accordance with the costumes they already have from a given region. Music and dances must match skills of the dancers. In general, groups are interested in authentically traditional materials, i.e. non-stylized, that were verified by researchers and experts in the field of folk culture.

Groups emphasized that folklore truth is the driving force for research in ethnographic records available today. They look for confirmation that a given dance, melody or song existed and that it is ethnographically embedded in a given region. Great importance is given to the correctness of the costumes and their fidelity to the tradition. These criteria determine further work on the preparation of a new performance.
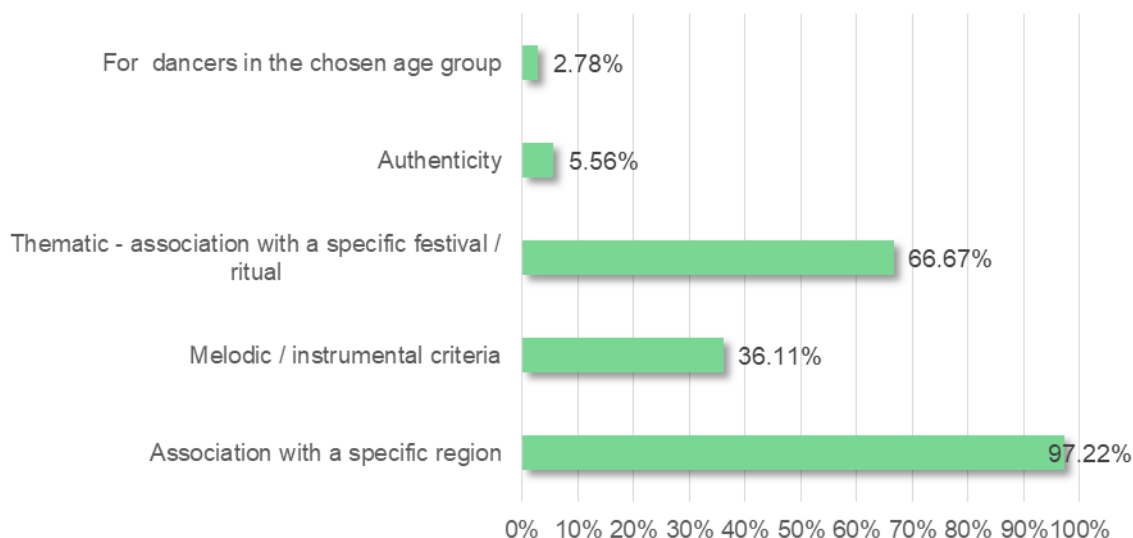
Figure 12 Source content search criteria

7. What are the stages of creating a new repertoire? (time frames, milestones, rehearsals)

The process of creating a new repertoire depends on the character of the group. It will be somehow simplified in the case of expat groups, where the ethnographic studies and finances are limited, and for native groups that create their own music still within the context of traditional folklore. The process is long and multistage in case of large groups with a long tradition. It is preceded by the deep ethnographical study of a given rite. Nevertheless, the pattern is always the same: research on the region or sub-region, selection of music, developing choreography and stage arrangement by the choreographer, classes with musicians, classes with dancers (steps and dance figures), multiple rehearsals (once or twice a week) and finally, a performance. Cooperation between a choreographer and a musician writing music for a given dance presentation as well as with a singing teacher is important. The time it takes to create a piece depends on its length. Creating a suite of dances takes several months up to a year (searching for sources, texts, editing), and creating a song up to several days. In general, preparation time in most cases is claimed to be the same, one year (sometimes even two years). In the case of expat groups, e.g. "Karolinka" from London, UK, the procedure starts with the collection of funds that may take several years. Then, the expert from Poland is invited to lead dance workshops. Next stage is music development and recording followed by rehearsals. In the meantime, the costumes are sewn.
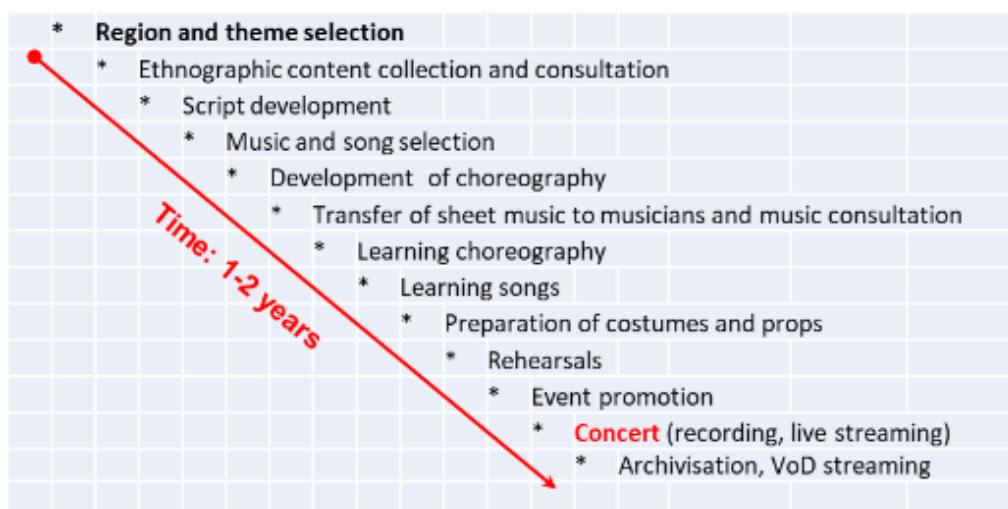

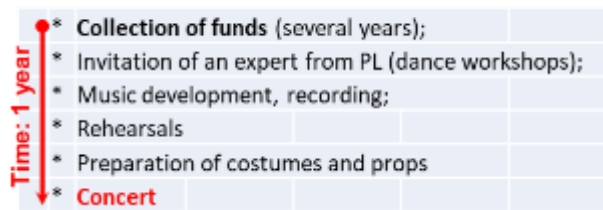*Figure 13 Repertoire creation stages for ensembles based in Poland*

Figure 14 Repertoire creation stages for ensembles based abroad

Kashubian group "Sierakowice":

"We are trying to keep the repertoire of our own region (Kashubian) unchanged. Reaching for a repertoire new to us (e.g. dances from other regions such as Łowicz or Kraków), we start with workshops with a folk group representing a given region. A new repertoire is developed and taught successively on each rehearsal of the ensemble, after repeating known material."

Song and Dance Ensemble of the University of Warsaw "Warszawianka"

"The artistic director decides on the direction in which the ensemble is to go, based on his own reflections, ideas, and inspirations. He proposes, for example, a specific region that is not in the repertoire but considers it valuable. Then the music manager, in consultation with the artistic director, searches for musical topics and melodies in the scores of the selected region. The choreographer prepares to find a musical composition, i.e. he reads about the traditions of the region, costumes, songs, and dances. After presenting the musical composition, the musician discusses the work with the choreographer so that, after any necessary corrections, the choreographer can arrange the movement to the music. At the same time, the previously selected costumes are sewn. The time frame is very difficult to define, sometimes a composition is created within a few months, sometimes a year or two. However, this process includes everything from the idea to the staging of the composition."

Folk band leader - Janusz Prusinowski

"I have been playing some of the pieces for 25 years, these are the first obereks and mazurkas I have learned. Sometimes I only come back to them now, confront the original recordings and start playing together with the ensemble. Usually, apart from the melodies that we already play, that we like and that we perform at concerts, we have so many that we gradually play and play, watching carefully whether they are already suitable for public performance, that is, whether they "play by themselves without using the mind". An important part of the work is also recordings of rehearsals or concerts, which we listen to critically and thoroughly in terms of musical quality, specificity of sound and timbre, energy, mood, authenticity, etc. Then we often make studio recordings, first on our own, then in a partnering studio. At this stage, all the details, phrases, and colours get together."

"Tatry" from London:

"Due to the nature of our activity (voluntary membership), age and varied skills of dancers, recruitment of new ensemble members and loss of existing dancers, the entire cycle from the selection of dances and choreography to the presentation of a suite of dances during the performance sometimes it takes a year or even two years. Our choreographer composes all choreographies by himself. They are created so that they can be adapted to the number of available dance pairs, the needs of a given performance, for example, time constraints or the size of the stage, and the skills of the dancers available for a given performance. Generally, it takes 1 to 2 years."

"Ziemia Żywiecka":

"Collecting information about the region of interest, rituals, traditions, etc. consultations with an expert, specialist in a given region, selection of music, songs and dances, developing a scenario, preparing music and singing arrangements, developing choreography, learning individual elements: music, singing, steps, and dancing figures, learning choreographic drawing, learning to behave on the stage (dialogues, acting) combining all the elements following the prepared scenarios. Preparation of props and directing the show. The preparation of a new show takes about half a year; rehearsals take place twice a week, and on weekends or during the folk camp outside the city".

Section C. Cooperation between Group Members

The questions in this Section relate directly to technologies that facilitate or may facilitate collaboration between group members. We ask explicitly about communication channels used, organization of remote rehearsals and performances. We wanted to know, if the group is aware of the existence of new tools for music networking.

1. How do you organize rehearsals? How often do you practice?

The majority of folk groups (94.4%) practice regularly, 19.4% of groups meet when it is needed and 13.9% declared that they meet both regularly and on demand. Music and dance ensembles generally would meet at least twice a week to practice dance and singing. When needed, their regular folk bands also join rehearsals. Such regularity is required due to the fact that most dancers and musicians are amateurs. They need more time and regular practising to learn steps, choreography, songs, and get familiar with music.

Professional ensembles, for which playing concerts/gigs is their major source of income, might have different rehearsing patterns. For example, musicians of "Janusz Prusinowski Kompania" band practice intensively before performances and, in addition, they meet several times a year for longer sessions that can last few days to build a new repertoire.

2. What communication channels do you use (between group members) to help with organization and implementation of the creative process?

In terms of communication channels used between group members, direct communication during rehearsals in situ (94.4%) remains the main way of exchanging all relevant information. However, for organising groups' logistics and activities, digital technologies have been embraced in full. Survey data showed that second most popular channel (83.3%) is communicators (e.g. WhatsApp, Facebook Messenger) followed by two *ex aequo* categories such as mobile phone/text messaging and social media (e.g. Facebook, Instagram, Twitter) (80.6%). Electronic mail (emails) and video conferencing (via Skype or Zoom) are relatively less frequently used, 41.7% and 27.8% respectively.

All groups emphasised the importance of communicating face to face (during on-site rehearsals) as the crucial part of the creative process. *"The specificity of music, especially this music, lies in its physicality, in feeling it together, just like dancing in a pair."* said one the interviewees. For dance groups, this especially relates to ability for choreographers to provide direct instructions to dancers in order to correct movements on-the-fly as well as to cooperate closely with accompanying musicians who can watch the choreography and react when needed.
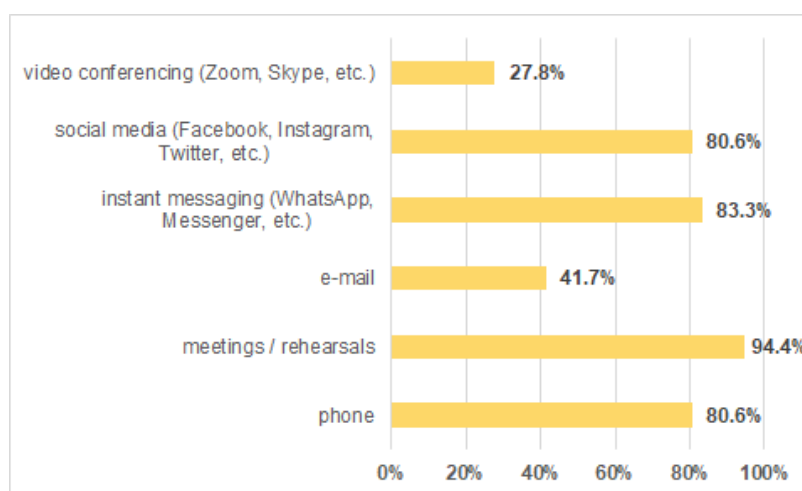
Figure 15 Polish folk ensembles. Types of communication channels.

3. What tools / systems are used for remote rehearsals?

Only 30.6% of folk groups declared that they also rehearse remotely, however, this has become a part of their general artistic practice mainly as a means to remain active during the COVID-19 pandemic lockdowns. Such rehearsals have been conducted over popular video conferencing platforms (Skype, Zoom, MS Teams, Cisco Webex, etc.). One group reported that their rehearsals took a form of recorded lessons placed on the YouTube platform. None of the groups used any of the currently available software for online music networking such as SonoBus, SoundJack, JackTrip, JamKazam etc.

5. What is the usefulness of remote rehearsals?

In regard to evaluating the usefulness of practising online the opinions ranged from being "negligible" to "quite useful". The most emphasised aspect of remote rehearsals was their social function, i.e. they allowed to keep the group members in touch and maintain emotional bonds within the group. For example, for "Tatry" and other groups affiliated with the Federation of Polish Folklore Groups in Great Britain, there were dancing and singing lessons organized over Zoom application. The interviewees reported that such meetings helped to keep the group members in touch and to maintain contacts within the Federation.

For learning and practising repertoire online rehearsals proved to be less effective. The main focus was on vocal and music lessons, basic dance instruction, exchanging ethnographic materials and decision making. It was pointed out that, especially in the context of dance instruction, over Zoom one can present only a few simple steps, and it is rather difficult to track the progress of the dancers and provide feedback. Also, one cannot practice dancing in pairs, or learn a longer part of choreography. What is important, not every dancer has enough space in which they can practice at home, so there is a risk of injury. Therefore, lessons were conducted in a form of a presentation that allows participants to enjoy a few minutes of dance from a given region.

6. What are the problems with remote rehearsing?

Major issues encountered while organising and attending online rehearsals were problems with connecting to the Internet (16.7%) and experiencing latency (16.7%). Other problems included general technical problems (13,9%), problems with user interfaces (5,6%) and software configuration issues (2.8%). In additional comments, groups pointed out the lack of suitable conditions for practising at home, especially for dancers, and the inability to practice dancing in pairs while being isolated from other group members. This is really important since group and pair dancing is a characteristic feature of Polish folk dance tradition.

Musicians of the "Janusz Prusinowski Kompania" band were exploring the potentials of JamKazam platform for online rehearsing. Their main concern was the experienced latency and the interface that is not easy to follow as for example would be a sound mixing console. They described their experience of playing together online in the following words:

"...slower pieces we were able to play, it was bearable. It was not great, but it practically sounded like you were playing in a studio, in a separate room, with the rest of the band in another room. However, with the tempo acceleration, this software was no longer able to handle it. I even connected to the router with a long cable since JamKazam does not tolerate WiFi. We went down to some really minimal latency, because it's all about latency, which is (related to) bandwidth. Each latency turns out to be audible...

...It depends on the type of music and definitely on rhythmicity, i.e. a linear music where you can wait a bit, move apart a little, change the focus a bit, it will easily defend itself here, it will work. Or music where, for example, you can share a metronome, it can work...."

7. Why are remote rehearsals not carried out?

When asked why online rehearsals are not considered as an option, of all answers provided, 28% stated that face-to-face rehearsals are more effective, others mentioned that either there is no need (20%) or no interest in such a form of collaboration (20%), 16% said that a serious disadvantage of remote practising is that it does not provide much capacity for teaching and practising dance in pairs. In terms of technical problems faced, those included lack of technical facilities (12%), lack of technical literacy (12%), and technical issues such as latency (12%). In addition, dance groups mentioned a general inability to teach/practice a full choreography while being remote (8%) as well as that the size of a group can be an issue itself making remote coordination really difficult (8%). They argued that during a rehearsal *in situ* a choreographer can show and correct the dancers' postures and steps and younger dancers can watch the instructor or senior members in motion. There is also an important social aspect to be considered since belonging to the group is often perceived as being part of a bigger family. *"Adults just want to dance, so online rehearsals don't make sense for them. Adults want to come and dance face to face."*

During the interviews, we additionally asked whether the groups **have considered to perform remotely when it is impossible to gather all members of the group in one place.** For dance groups, performing remotely has not been considered as an option for the same practical reasons expressed in regard to online rehearsals. For example, for "Tatry" group, since they don't have a regular Polish folk band and have to rely on ad-hoc volunteering musicians to join rehearsals or performances, a possible solution would be to establish a collaboration with one of the bands based in Poland and use live audio and video streaming. Video streaming is crucial as musicians need to follow the dancers' movements and overall choreography.

In case of the "Janusz Prusinowski Kompania" band, they take such option into consideration rather as a means for practising or running workshops but not for performing.

"I will not claim that if JamKazam would be better and there would be no latency, we would not play. I think then we would save a lot on fuel and other travel expenses. And we would actually have the sessions where we would be musically happy. Where we would part not frustrated but satisfied."

Section D. Data Storage and Sharing

This section of the survey was prepared to gather information on technologies that could be used to support documentation and sharing of the group's work and achievements. The questions focused on archiving technologies, types of digital resources that are stored, the form they are stored and who can access them. It was a crucial part of the survey as it has the potential to be used to guide the future development of IT

systems supporting preservation of artifacts gathered by the groups throughout the years. A summary of responses and related conclusions are presented below.

1. What kind of materials related to your ensemble's activities are stored in digital form?

In the context of digital data, it is usually stored in relation to the process of repertoire creation. Most of the groups (75%) keep the following content in digital form: music scores, performance scenarios, song lyrics and illustrations of costumes. The majority store recordings of their performances (97.2%). Apart from that, some of the groups keep recordings of their rehearsals (66.7%), photos (11%) and other items such as documentation or reviews. Overall, 94.4% groups store some kind of documentation in digital form.

2. Where do you store materials related to your ensemble's activities?

Almost all groups (except two) store digital materials on their local storage device (e.g. on pendrive, minidics, CD/DVD or alike). This is a primary way of storing data for more than 94% respondents. Cloud storage is also popular. Around half of the respondents (47%) use it to keep their digital assets . In addition, substantial part of respondents (69%) keep some of the data on analogue media (paper, books or on audio and video tapes). Based on the responses, one could derive a conclusion that there is a risk of losing data in cases where digital data are stored using only local storage and in cases where there is only one physical copy of the documentation (and not digitized). A visual summary of responses is presented below.
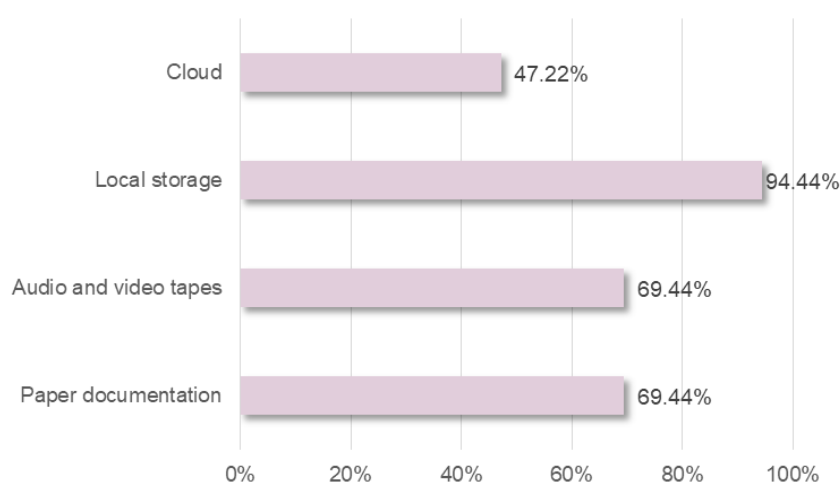
Figure 16 Ensemble's content storage location

3. Who has access to your ensemble's digital resources on a daily basis?

Almost all groups (97%) provide access to digital resources to all their members. One group limits access to their data to the management board only. There is also a number of respondents (38%) that provide data to users outside the group. The reason for limiting access to data is not clearly indicated, however, there are at least two possibilities: 1) due to the fact that digital data is stored locally, it is not an easy task to make it accessible to a wider audience; 2) there are limitations (e.g. IPR) or skepticism when it comes to a public distribution of the digital resources.

4. Do you have backup copies of the data?

Most of the groups (75%) claim to have backup copies of their digital data. 19% of respondents do not have backups and 6% does not know anything about them. Although three quarters of respondents claim to have backup copies, it would be beneficial to investigate this topic further and, for instance, verify

whether the undertaken approach is sufficient (e.g. whether it is aligned with 3-2-1 rule or uses external and trustworthy solutions). A summary of responses is visible below.
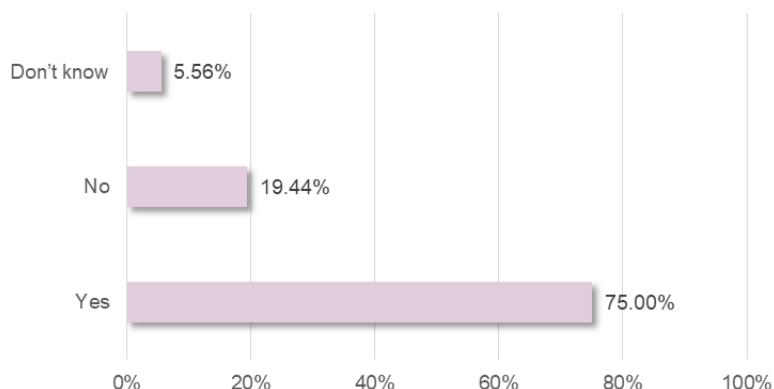

Figure 17 Ensemble's digital data backup

5. What kind of online-presence technologies do you use?

The most popular way for online presence is a profile in social media. Almost all groups (97%) have such a profile. Majority of respondents (63%) maintain their websites and some of them (19%) use other solutions (e.g. blog). This clearly indicates that the most important part of online presence is related to social media.

6. Who maintains online-presence tools used by your ensemble?

Most of the respondents (83%) indicated that ensemble members are responsible for the maintenance of online-presence tools. For 22%, it is responsibility of their financing institutions and only 11% claims it is responsibility of selected group members. Only two respondents reported that IT professionals maintain online presence tools for them. In the context of this question, it would be interesting to further investigate technical and editorial maintenance aspects, as the respondents could misunderstand the intention of the question. A summary of responses to this question is presented below.
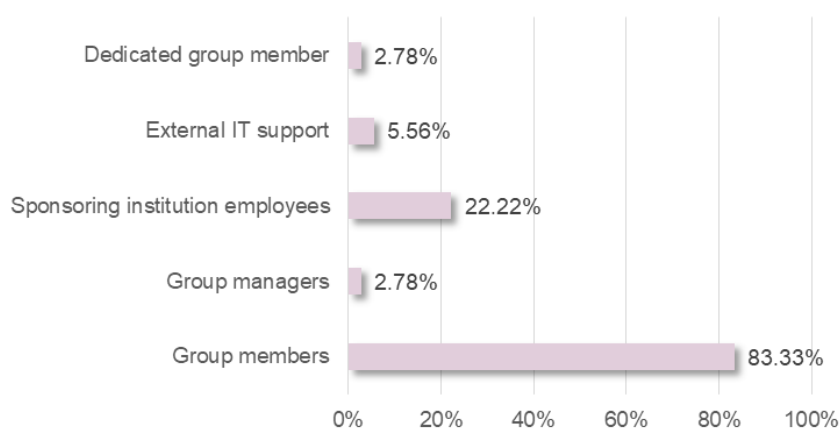

Figure 18 Groups' online presence manager

Section E. Artistic Events

Performances of the folklore groups are of special value, as they play an educational role in the society and become part of the heritage. Therefore, the crucial problem tackled in this Section concerns

determining to what extent new technologies affect and potentially have an impact on the promotion of groups' artistic activities. In particular, we wanted to know what digital systems for live streaming they are aware of and what conditions must be met to make broadcast over the Internet possible.

1. How do you promote artistic events such as concerts, competitions and festivals?

Typically a wide variety of means is used for event promotion. Majority of groups use social media and websites to post information about incoming events. The most common channel, used for promotion by over 97% of groups, is posting information on the event organizers' websites. The second most popular method is the use of social media. Over 90% of groups use their profiles for this purpose. Sponsoring institutions such as local community centres also play an important role by promoting events for 75% of groups.
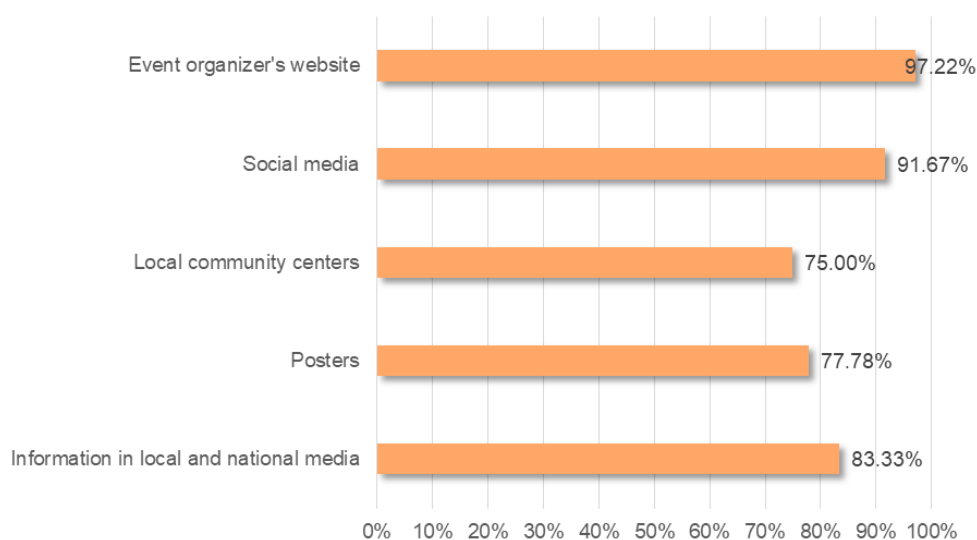

Figure 19 Means of artistic events promotion

Beside the Internet, also traditional media are used for promotion in the form of advertisements on the radio and in the newspapers both local and national, banners and posters. The traditional forms are especially useful in getting the message to people who do not follow the group on social media and may have never even heard about them. In other words, the Internet tools usually deliver the information in the "pull" mode while traditional forms of promotion allow the group to spread the information in the "push" mode and are more effective in reaching a wider audience. For example, a poster placed in a strategic location such as a train station in a small town may reach a larger group of people than an event preview posted on YouTube. The effectiveness of various traditional methods depends on the environment, i.e. a different approach is more effective in a smaller town than in a big city.

"... with social media we can decide who we observe, who we are interested in, and often our events related to the harvest festival or St. John's Night, they are to be directed not only to those who follow us on social media but to a much larger audience. In this case, to the residents of the entire town where the event is held and these posters are still irreplaceable. I think that they are, as for today, equally noticeable as posts on the Internet. "

Overall, the Internet tools are widely used for event promotion but more traditional means should not be underestimated. Furthermore, more advanced users are aware of drawback of social media based promotion. Some groups have experienced difficulties in propagating festival information after changes introduced in Facebook algorithms.

Communication channels used for propagating event information can be related to the format in which the event is held (posters would rather promote live concerts than live transmission over the Internet while posts on the website or social media are likely to promote both formats).

2. Is coverage of the artistic events available on the Internet?

Majority of groups (over 78%) make event recordings available on demand (VoD) while live streaming is performed by almost 64% of groups. VoD seems to be more popular. It has been pointed out by some of the groups that live streaming is more challenging and at the same time may not attract audience large enough to make it worthwhile.

In total, close to 89% of all groups make their artistic event available on-line in one form or another. However, it is impossible to determine whether all, majority or only some of the events for a given group are recorded and made available over the Internet in either form.
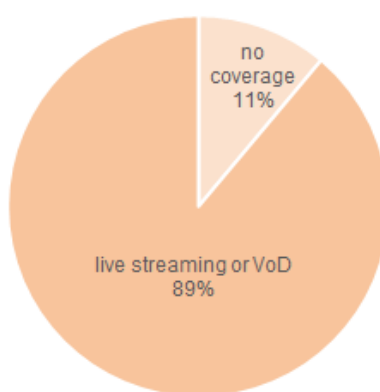
Figure 20 Artistic events coverage on the Internet

The availability of channels for live streaming or VoD does not seem to be a problem. YouTube and social media are commonly used for this purpose. It is rather the quality of recordings that can be produced with technical and financial means available to the group or lack thereof that prevents online coverage of the events being more popular.

Some of the groups mentioned photo coverage as the most likely format of the Internet-based coverage used by all groups due to small cost compared to video recording.

3. What conditions must be met to make it possible for an event to be transmitted over the Internet? Who makes recordings of your ensemble performances?

For the interviews the question was about conditions that would need to be satisfied in order for a group to organize an event which would be transmitted over the Internet.

Such conditions depend a lot on the event type and its scale. A small event may be recorded with a smartphone by group members or its director but this is done mostly for documenting groups' activities rather than for publication on the Internet. However, smartphones may be sufficient also for a chamber concert recording. Larger events, especially with dance ensembles performing, require more professional approach and equipment i.e. several cameras, microphone sets and a dedicated crew for both recording and post-processing. Showing dance arrangement that involves a dozen dancing pairs requires several

cameras and appropriate mixing of footage from these cameras. Hence, there is a financial barrier in organizing live streaming by a group. In some cases, a professional crew and equipment are provided by an event organizer and then live streaming is more likely to take place.

Another important aspect is the objective of the recording. It can be done for promotion of the group's activities or the objective may also be preparation of the educational content and preservation of the local tradition. In the latter case, content production requires much more effort since correctness and authenticity of the performance should be ensured. It means that besides professional production crew and equipment also the group's members should be involved and supervise the process. It is difficult since they would have to supervise the performance and the recording at the same time.

For the survey a more precise question about recording was asked, namely who performs recording. Majority of groups (over 80%) record the events by themselves with simple equipment such as smartphones. A little over 47% have more professional equipment such as cameras and microphones at their disposal. Professional crews, if involved in recording events, are typically hired by event organizers. Over 47% of groups had their concerts recorded in this way. Much smaller number of groups (17%) cooperate with companies that provide such a service. Overall, more than 52% groups have their events recorded by a professional crew.

Most likely reason to hire a professional crew and their equipment is to document larger and more important events while smaller events are recorded by the groups themselves with whatever equipment they have at hand.
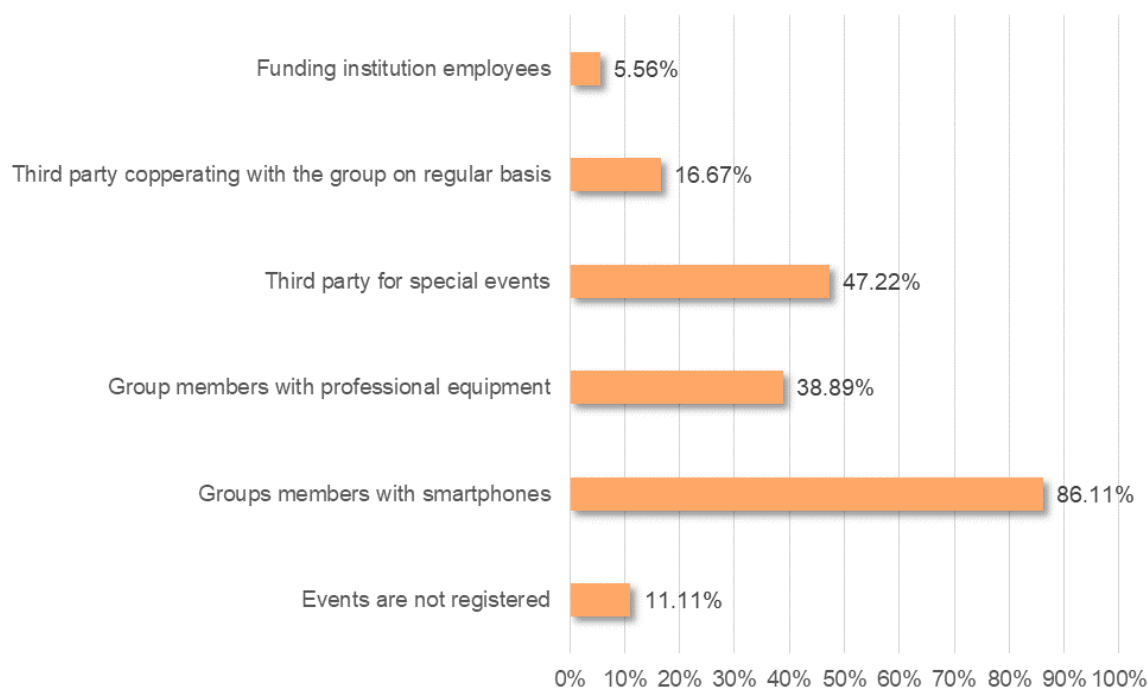
Figure 21 Artistic events recording

Artistic event coverage and consequently its availability on the Internet have its financial aspect that often determines a group's ability to hire professional service or to acquire or rent professional equipment. Since availability and the use of smartphones is so common, one way to improve the quality of event recording would be to provide a low cost solution for arranging recording with several smartphones (selecting their number and placement on the stage) and combining footage from these devices into one coverage. A better quality coverage may attract larger audience for both event live streaming and VoD.

A number of groups pointed out that they need better A/V equipment for recording not just events but also rehearsals as well as software for sound and video processing and editing. More precisely, 19% of the groups expressed a need for recording capabilities in general, with several of these groups mentioning specifically recording equipment and several more mentioning film and sound editing tools.

Section F. Looking into the Future

1. Letting your imagination run wild, what technologies, solutions, programs would make your life easier?

The answer included technological solutions in several areas. Almost 31% of groups indicated an interest in solutions regarding artistic event and rehearsal coverage, i.e. good quality recording equipment and video / audio / photo editing software. The second most popular area (16 %) was repertoire preparation including access to the digital ethnographic source repositories, software for preparing choreography arrangements and recording music for dance ensembles. Almost 14% of groups were interested in solution for communication among ensemble members as well as communication among ensembles such as tools for managing ensemble's website. Relatively small number of ensembles (less than 6%) considered archiving solutions, specifically cloud based repositories integrated with group's website.
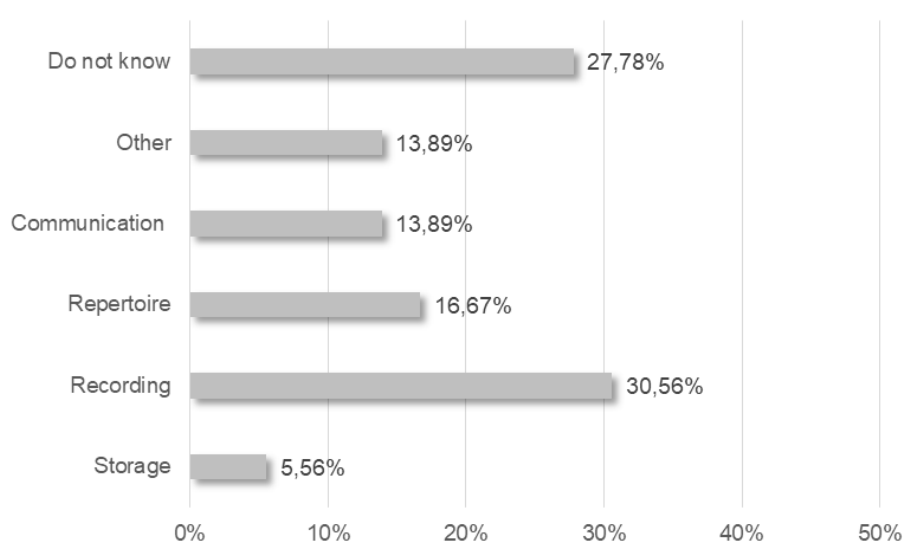

Figure 22 Technological areas with solutions making group's life easier

2. Other comments, observations, reflections on the use of digital technologies in group activities?

Some groups indicated the main reasons for not using digital technology in their activities. They were lack of sufficient funds and lack of competence of groups' members. Most groups do not have people dedicated to digital technology related tasks. They have members who are trained to be instructors or choreographers and it is difficult to combine responsibilities in two different areas. A free of charge training or workshop dedicated to learning new technologies was pointed out as a possible solution.

"The main problem of insufficient use of digital technologies is the lack of sufficient budget for the core activities of the ensemble, let alone investing in marketing tools, design, or in-house equipment for high quality recording and sharing of materials. Another frequent phenomenon is the lack of appropriate competencies among the members of the ensemble, who are prepared for the profession of an instructor or musician rather than a computer graphic designer, computer scientist, manager or marketer."

4.2. Infrastructural Requirements – MoSCoW Prioritization

Based on the information obtained through the survey we have compiled a list of guidelines for the folk ensembles regarding technological solutions which should or could be used to support their artistic activities. The guidelines are defined for each area of activities and represent also requirement towards an infrastructure. They are prioritized according to the MoSCoW technique for managing requirements, i.e. assigned one of four categories to each element: must-have, should-have, could-have and won't have.

Table 2 MoSCoW prioritized requirements towards infrastructure

	Area	Requirement	MoSCoW
	B. Repertoire	1. Reliable online content repositories for repertoire search	M
		2. Project management platform	C
	C. Cooperation between group members	1. Communication tool for delivering messages in "push" mode	M
		2. Online rehearsals during social distancing as a replacement of rehearsals *in situ*	M
		3. Online rehearsals during normal times as a supplement to live rehearsals in order to provide basic instructions, prepare materials	C
		4. Online rehearsals software (lack of awareness of the solutions, with no familiarity difficult to assess usability)	M/C
	D. Data storage and sharing	1. Secure and trustworthy storage space for keeping digital assets 2. Shared access to the storage space (among group members) 3. Presence in social media	M
		4. Public access to stored data 5. Dedicated websites or blog platform	C
	E. Artistic events	1. Event promotion / group presence on the Internet	M
		2. Video and sound editing software	S
		3. Professional / good quality video and sound recording equipment	C

4.3. Conclusions

In most cases, the artistic director plays a key role in **selecting and developing a repertoire** for the ensemble. Therefore, he/she decides also on the use and choice of the ICT technologies at various stages of the repertoire preparation and presentation. The main source of material for creating the repertoire are ethnographic records and traditional songbooks. Folk groups still discover and cherish regional songs, dances and rituals. Although, online repositories are becoming a recognized source of music and choreography material, there is still a need to encourage the groups to search for content in digital libraries and to make their own resources available online.

In terms of exploring tools for **within-group collaboration**, folk groups have quite clear view on remote rehearsals, i.e. such rehearsals are not considered as an option to replace face-to-face meetings. For dance ensembles, the main problem relates to practising dance with multiple participants. The group needs to be together to interact with each other and with the instructor when performing. For folk bands, the biggest issue is the latency introduced by the audio streaming software, that makes synchronization between instruments, especially in fast-paced tunes very challenging, if not impossible. Because remote rehearsals have not been properly tried out, following this approach would require deep investigation and experimentation with innovative tools and approaches, e.g. 3D visualisation, immersive technologies/VR or ambisonic sound. The situation is slightly different for music groups which can use solutions such as JackTrip [7], Jamulus [8], SonoBus [6], Soundjack [9], Audiomovers [10], Clean-feed [11], Artsmesh [12], or LoLa [13].

Analog and digital objects are both used by the folk groups in their day-to-day activities. Digitization of the physical assets could be one of the ways to preserve and curate, in the long term, both tangible and intangible cultural heritage (e.g. recordings of rehearsals, pictures from performances). In addition, digital materials are not always easily available online (e.g. they are on CD or DVD), thus their proper digital curation (e.g. within digital repository) could improve their discovery and accessibility. In practice, digital materials are not archived in a trustworthy repositories, they are usually scattered across the group members computers and stored without proper replication routines. This situation poses a risk of losing these materials, that are in many cases the only source of reliable information about specific folk groups (their customs, repertoire, costumes, ...).

The two most important conclusions when it comes to **data storage and sharing** are as follows:

- Having a trustworthy repository to improve preservation and access to folk groups related digital materials would contribute to both cultural heritage and research sectors (e.g. in the context of Europeana or OpenAire). Preserving these tangible and intangible cultural heritage assets as well as using them in various research scenarios has been and still is a challenge for our information society.
- The aforementioned repository could be initially loaded with data from folk groups social media. Such an approach could, on one hand, provide a basic safeguarding of existing and already available online digital assets. On the other hand, it could act as a data archiving platform for materials that are kept internally by the folk groups, but could be publicly shared or privately stored in a trustworthy manner.

Artistic event promotion is an area in which technological solutions are commonly used. Increasing availability of event live streaming and VoD which is limited due to lack of good quality recording equipment and insufficient funds, could be achieved by the use of low cost devices such as smartphones, developing software solution for video, audio and photo content editing combined with training on how to use these tools provided free of charge for group members.

5. Workshop

The purpose of the workshop was twofold: 1) to present data analysis results and conclusions to the representatives of the groups participating in the data collection process and to facilitate experience sharing and discussion on the artists' requirements towards technological solutions, and 2) to expose the

artists to the selected technological solutions that may support their activities. Consequently, the workshop was divide into two parts.

During the first part, a statistical summary for each activity area was presented giving the participant an opportunity to confront his or her position on a given matter with the responses from other groups and to provide comments. The second part of the workshop included presentation of technological solutions in three activity areas, namely source content search for repertoire building, groups' content archiving and management, and remote rehearsal organization.

All groups which participated in the survey were invited to the workshop and about 1/3 of them responded to the invitation.

5.1. Discussion Summary

The first part of the workshop was devoted to the presentation of the summary of data collected through the survey and discussion of the conclusions. The comments that workshop participants shared with us can be summarized as follows.

Discussion after presenting summary of the survey:

- before COVID-19 no one imagined that online presence tools can be helpful in coordinating activities of the folk groups, now they seem to be indispensable;
- it was surprising that there were some folk groups with hundreds of members;
- social media are important in promoting artistic activities;
- it's important to note that whole families are involved in folk music practice, the passion is passed from generation to generation;
- there is a huge interest in folk groups, some very successful groups organise recruitment sessions where only a small number of applicants are accepted;
- considering changes caused by COVID-19 pandemic, there is a need to get more financial support, e.g. concert tours have been cancelled, which means that typical revenue sources are not available;
- in regard to training sessions, many groups would be interested in participation, however, such trainings need to provide clear benefits, e.g. give a chance to promote a group;
- there are some technological solutions with which people are not familiar and they need time to learn how to use them in daily activities;
- some groups declared that they would try the tools which were presented during the workshop and check their applicability in their practice, however, they could see the limitations, e.g. lack of good quality equipment (only built-in laptop microphone and sound card available);
- group members who are more experienced in using online tools claim that these tools are not able to replace real-life connections and relations between group members, still they may be useful in times when face-to-face communication is not possible; similarly, social media are not able to replace real-life relationships;
- an interesting and positive conclusion from the survey is that so many people are active in folk groups.

Following the discussion, a short live survey was conducted regarding the two most important needs and willingness to invest time in learning about technological solutions that may support groups' activities. The answers were as follows.

1.What are the two most important needs?

      A. reliable source content repositories   50%

      B. project management tools   0%

C. remote rehearsals software	30%
D. group's resource archiving solutions	30%
E. shared data storage space	16%
F. event and rehearsal recording / editing software	50%
G. other	16%

2. Do you see the possibility of investing time in learning about new technological solutions (e.g. participating in a free of charge training)?

A. yes	100%
B. no	0%

Software for recording and editing rehearsals and events was the most commonly selected option with the second place shared by software for organizing remote rehearsal and group's resources archiving solutions. All participants indicated willingness to invest time in learning about technological solutions which was not surprising given the fact that they were interested in participation in the workshop.

5.2. Demo Session

Based on the survey results we have selected a few solutions in the key technological areas to be presented during the demo session.

The first area was related to Section B of the survey (Repertoire) and in particular, to providing support in finding online source content. The solution selected for this area was **Europeana** portal [4] and search for folk music and music-related content. Europeana provides digital access to millions of cultural heritage items from institutions across Europe. It is a common access point to many collections and catalogues of libraries, archives and museums. Currently, Europeana collections provide access to over 50 million digital items such as books, music, artwork and more, with search and filtering tools available in one place. DARIAH and Europeana are linked by long-term cooperation. The humanities researchers represented by DARIAH are the key audience of Europeana as a provider of digital cultural heritage data. The presentation included search for folk tradition related content such as folk costumes, songbooks and historical music records.
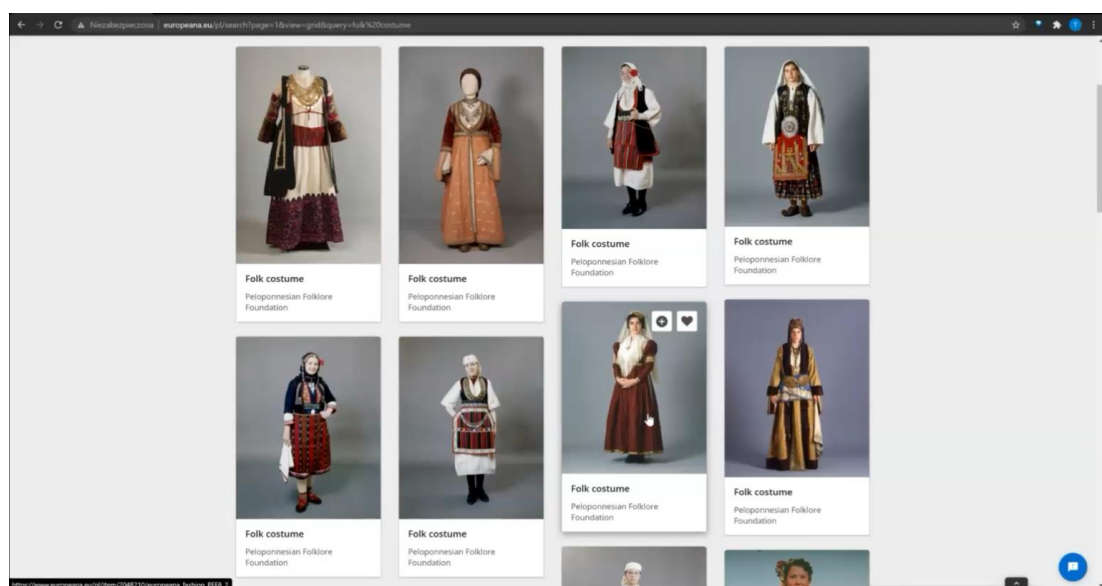
Figure 23 Folk costumes search results in Europeana

The next area was related to Section D of the survey (Data sharing and storage). The solution selected for this area was **LoCloud** [5] which offers cloud-based technology and services to support small and medium local institutions in aggregating their digital resources and making them available through Europeana. One of LoCloud's objectives is to use cloud computing technologies to reduce technical, semantic and skills barriers for its users. LoCloud provides, among other things, easy start, support for small cultural institutions, sharing of many different collections, and support for many different data formats. Hence, it may be a good starting point for groups which do not have much experience in using cloud based repositories.
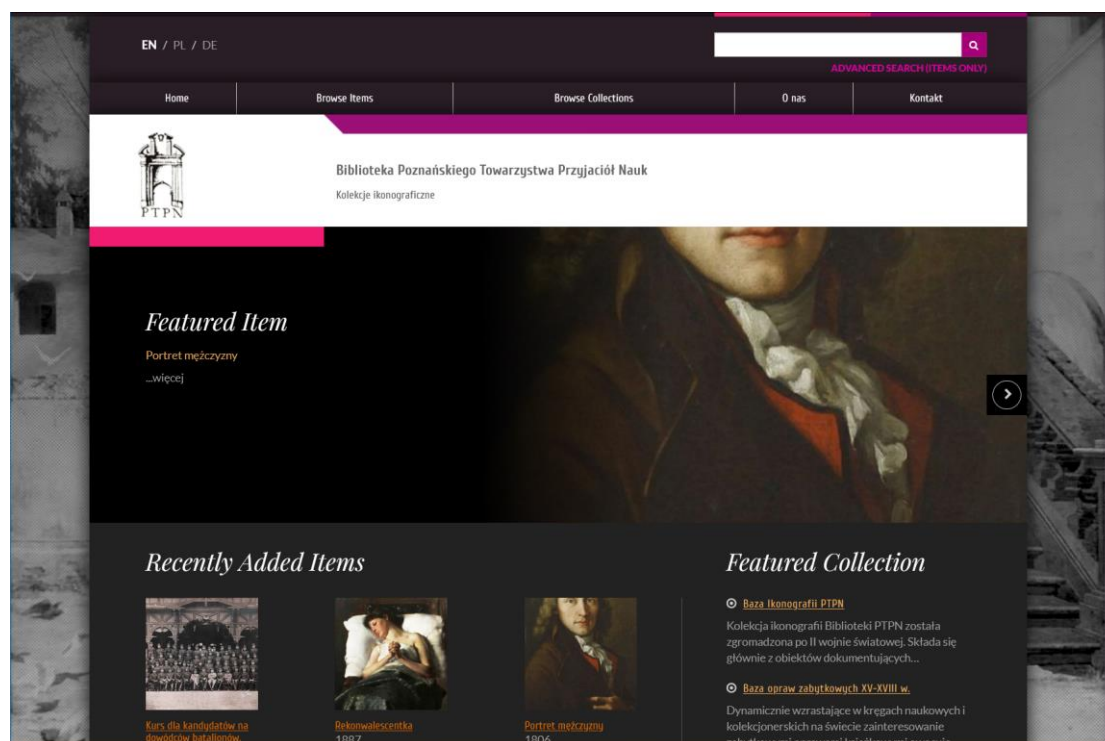

Figure 24 An example collection hosted in LoCloud

The third area was related to Section C (Cooperation between the group members) and more specifically, to organization of remote rehearsals. Since a number of groups expressed concern about the feasibility of organizing such rehearsals due to technological limitations (e.g. latency), a practical demo of one of the solutions was preceded by a short presentation of the technological issues related to the **Networked Music Performance** systems.

For a practical demonstration, we have selected **SonoBus** [6], a system which can guarantee low latency (the delay of up to 30 milliseconds is considered acceptable for a classical music performance). The demo was based on our collaboration with the Female Laptop Orchestra project[1] that specializes in telematic performances spanning different global locations. A practical setup for collaborative music playing was presented in order to encourage the groups to consider using this type of technological solutions.

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[1] https://femalelaptoporchestra.wordpress.com/
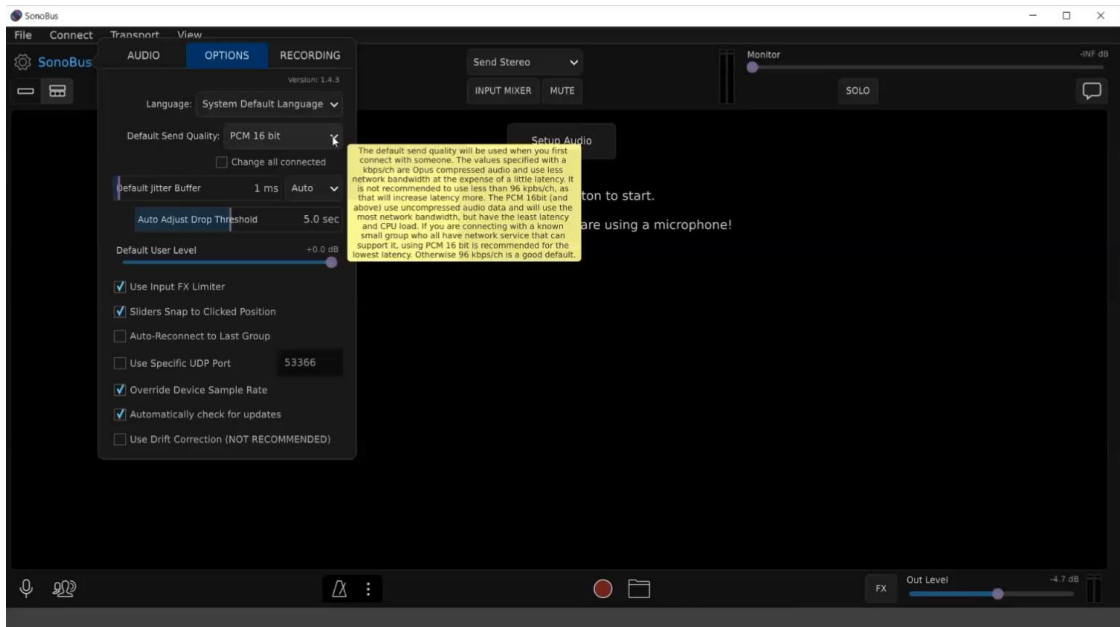
Figure 25 SonoBus configuration demo

6. Summary

In this project, we have developed methodology for obtaining both qualitative and quantitative information about the use of ICT in artistic practice of folk music and dance groups. We implemented this methodology in order to acquire knowledge on technological needs of folk practitioners. Although the methodology was designed for Polish folk groups, we believe that it can be applied more universally, especially in Europe, to obtain information about folk groups' needs in other countries.

We have focused on folk music and dance artists since they play a crucial role in preserving intangible cultural heritage, however, their needs as multimedia creators and consumers are seldom analysed and addressed. Another objective of studying needs of traditional music artists was to introduce this particular community to the possibilities offered by the multimedia technology in engaging the public with intangible heritage in surprising new ways.

Implementing the aforementioned methodology allowed us to gain an insight into how folk ensembles operate, during the COVID-19 pandemic and non-pandemic times, and how their activities are performed in various areas. The analysis of the data collected during the project has revealed that digital research infrastructures have some capabilities to address folk groups' needs. However, the ensembles are not always aware of the existence of these infrastructures and capabilities they offer. Hence, there is a need to expose them to such solutions. There is also a clear need to develop new tools that would address some of the requirements without imposing financial costs. Some of these needs are not technologically demanding and they could be addressed if providers of multimedia technologies were more aware of the fact that such needs exist. Interestingly, these needs are often as basic as archiving of multimedia content produced by the group as opposed to more sophisticated solutions, for example platforms for online rehearsals and motion capture systems for dance.

As developers of digital solutions for arts, humanities and cultural heritage, we hope that our findings will facilitate implementation of dedicated tools that are user-friendly, cost effective, easy to employ and can be used on a large scale.

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