European Cooperation in the field of Scientific and Technical Research

- COST -

Brussels, 24 May 2013

COST 019/13

MEMORANDUM OF UNDERSTANDING

Subject :	Memorandum of Understanding for the implementation of a European Concerted Research Action designated as COST Action FP1302: WOOD MUSICK

Delegations will find attached the Memorandum of Understanding for COST Action FP1302 as approved by the COST Committee of Senior Officials (CSO) at its 187th meeting on 15-16 May 2013.

MEMORANDUM OF UNDERSTANDING
For the implementation of a European Concerted Research Action designated as

COST Action FP1302
WOOD MUSICK

The Parties to this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 4154/11 "Rules and Procedures for Implementing COST Actions", or in any new document amending or replacing it, the contents of which the Parties are fully aware of.

2. The main objective of the Action is to improve the conservation and knowledge of our wooden musical instruments heritage by increasing interaction and synergy between wood scientists and other professionals including instrument makers, curator, organologists.

3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 40 million in 2013 prices.

4. The Memorandum of Understanding will take effect on being accepted by at least five Parties.

5. The Memorandum of Understanding will remain in force for a period of 4 years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of Chapter IV of the document referred to in Point 1 above.

A. ABSTRACT AND KEYWORDS

This Action aims to combine forces and to foster research on wooden musical instruments in order to preserve and develop the dissemination of knowledge on musical instruments in Europe through inter disciplinary research. This program involves curators and conservators on the one side, wood scientists, chemists and acousticians on the other side, and finally, researchers in organology and making of instruments.

As part of the CIMCIM (International Committee of Musical Instrument Museums and Collections) network, working with some members of the former WoodCultHer COST and with makers, the project will integrate study, conservation and preservation works on musical instruments in heritage, and will allow the different European teams working on wood to participate in research projects on musical instruments. The collaboration will help to develop cooperative programs on specific projects about the study and identification of artefacts and about the conservation of musical instruments.

Keywords: Wood, conservation, musical instruments, inter-disciplinarity, network

B. BACKGROUND

B.1 General background

Like most art objects related to intangible heritage, wooden musical instruments transcend their figure to become the cultural symbols of a period, of a place or of a group of persons. They assume a fundamental importance such as technological advances, idols rituals, outer sign of power and incarnations of the spirits or media rites of passage. Wooden musical instrument could be considered as a high-tech application of wood product since they need many competences to be developed. Producing sound, they become also the oral symbols of extra-musical concepts aiming to communicate inexpressible ideas in a different way: the music.

Today, it is clear that the study of music includes a large number of research fields (composition, musical practice, musical history, musical perception, musical therapy, etc. …) while the "employed" musical instrument has still been the object of little research. However when the musical instrument joins a cultural heritage collection, it puts in evidence one or more cultural intrinsic values such as:

- historical: musical instrument as a bearer of information (know-how, musical context);

- cultural: musical instrument as a witness of musical traditions;

- history of techniques: musical instruments have been the state of the art of technologies;

- aesthetic: musical instruments as the subject of handsome materials selection

- acoustical: musical instruments as sound producer;

- mechanical: – maybe less known – the musical instrument as an engineering object (often very small amount of material used to support strong stresses).

This, however, implies studies and changes in the criteria that attribute value and interest to the instrument: its historic role and connections, its rarity, its peculiarity of shape and material may become more relevant than the quality and power of its sound or its usability for concert repertoire.
In Europe, it is very difficult to evaluate the numbers of items kept in the museums, but an approximation could be made: more than 100 000 instruments belong to more than 30 public collections.
The musical instruments heritage is then the perfect object to be studied under the multidisciplinary approach.
The question of studying and preserving wooden musical instruments has been dealt with by several museums and organisations throughout the world. But up to now, these instruments are investigated almost always at a unique point of view:

- the conservation point of view, thanks to the CIMCIM (one of 25 international committees of ICOM). It aims to promote professional standards in the conservation of musical instruments in museums and collections);

- art and humanities science approach (thanks to the MIMO project museums came together to create a single online access point to their collections);

- making point of view, professional associations hold regular meetings to exchange their know-hows about a living activity);

- acoustics approach. Society meetings are organised and some of which are dedicated to musical acoustics, and sometimes trying to make a link to the making process;

- wood science point of view. European spruce “resonance wood” has attracted numerous studies, but still little has been done about the link to historical and cultural aspects, information is often missing complex behaviour including aging, and other wood species used in musical instruments.

However COST Action IE0601 has clearly evidenced the importance of a multidisciplinary approach to the conservation of the wooden cultural heritage. Importance that has been also highlighted in the final remarks of the Cost Strategic Workshop “The Safeguard Of Cultural Heritage”, held in Florence in 2011, that call for a closer cooperation among the human dimension, the societal function and the science and technologies in order to establish a proper and effective conservation of Cultural Heritage (CH). It means that for achieving the aim of preserving wooden musical instruments, museum professionals (curators and conservators), specialists of musical instruments (organologists, historians of techniques, makers) and scientists have to work together.

B.2 Current state of knowledge

It should be emphasized that conservation of wooden musical instruments depends not only on the conservation of wood as a material, but also on maintaining the other values such as the aesthetic value or the functionality of the instrument or even the knowledge related to the making process as a whole.

In this context the main state of the art of the fields to be set into relation can be summarized as follows:

Xylology

Systematic studies of the wooden species used for musical instruments have found different level of development in different parts of the world. In some cases (i.e. European stringed instruments) the level of knowledge on the species of the main parts of the instruments is quite good. However, it is very poor in other contents, where the different bio-geo-cultural areas of instruments making have determined a broad diversity of species used, as well as cultural values such as symbolic aspects and sociological relations of human groups to their environment. Considering the several thousand of wooden species suitable for making musical instruments and the importance of the knowledge on wood species, identification of the species is then needed for documentation and understanding of the making process of instruments.

Dendrochronology

In addition, the support of the dating of wood, dendrochronology can bring other hypotheses about the wood supply of historical makers, and even first data on wood features.

Optics

Another feature is the optical aspect of wood. It has been suggested that, as a criterion of selection of luthiers, visual features, for example the waves of curly (or “fiddleback”) maple, could play a role at least as important as that of mechanical/acoustical properties.

Wood mechanics

High variability of wood mechanical properties is the result of species diversity, variety of growth conditions, conditioning, etc. But it is also a good reason for wood to be widely used through a wide range of instrument families and organological functions: some species better fit to high rigidity to mass ratio problems, whereas others are chosen for damping properties and some for both type of criteria.

Organology, musicology and musical iconography

The description and history of the making, the tuning and the use of musical instruments needs to stay in touch with a view of the history of music. History of techniques, history of instrument making and instrument restoration are required to replace the studied wooden artefacts in their context.

Natural heritage studies

Working on natural heritage can bring a different view on the study of botanical species used for the musical instrument. Cultural values such as symbolic aspects and sociological relations of human groups with their environment are an aspect of the multidisciplinary network.

History of techniques

Wooden musical instruments considered as precision artefacts reflecting historical trends lead to the study of the history of wood choice and circulation and its use in wood crafts.

Musical instrument conservation techniques

Observation by conservators of the artefacts and of their state of conservation is needed to identify the preceding restoration and the original parts of the instruments.

Mechanics and acoustics

Wooden soundboards amongst other instrument parts are very interesting and complex objects for researchers in the fields of mechanics because instruments are made to produce sound. They are usually studied from a dynamical point of view, but the various making stages can be looked also from a statical point of view.

However, there is still no systematic synthesis of all these fields to improve the conservation and the documentation of wooden musical instruments heritage except some individual case studies such as the pianoforte restoration in the Händel-Haus in Halle/Saale, the documentation of the unique organ in the Correr collection or the fac-simile realization in Cité de la musique.

B.3 Reasons for the Action

The brief summary above provides an overview on the diversity of disciplines and approaches that are, or could be, involved in the conservation and knowledge on historical musical instruments. However, up to now, these different domains have seldom been set into relation. The main reason of this action is to allow and promote close relations and collaborations, in order to advance the multi-disciplinary knowledge on historical wooden instruments, which could benefit:

- to the conservation of institutional collections, enriching the CH documentation (given the multiplicity of musical instrument making through centuries, a network of scientists needs to emerge to give material knowledge for museum professionals to synthesize the necessary elements from different fields of knowledge and describe the instruments in detail);

- to the information of the public, developing pedagogical tools to explain e.g. the wood structure ageing and the musical instrument running;

- to the present-day craftsmen, for whom the study of historical instruments could improve their knowledge on the mechanical structure ageing and disappeared know-how, since museums need makers to recreate some disappeared gesture thanks to fac-simile making;

- to wood and engineering scientists, encouraging access to old instruments to give insights into the long-term response and ageing process of wooden structures.

B.4 Complementarity with other research programmes

The Action will be based on achievements of existing and already terminated international and European networks and will benefit from synergies with current research activities.

- MIMO (Musical Instrument Museums Online) is a consortium of 11 important European public collections responding to the need for international transfer of knowledge and information concerning instruments, which has brought together digital collections of 53000 musical instruments with a single online access. To enhance and develop knowledge on the different corpuses, institutions and international programs can now be launched for different types of musical instruments which would benefit to the different collections.

- CIMCIM impulses meetings and produces recommendations to museums engaged in the conservation of instruments.

- ICOM-CC (the International Committee for Conservation of the International Council of Museums) has a “Wood and Furniture” Working Group, which covers all areas of wood such as wooden objects, wooden furniture, ethnographic wood (totem, poles etc.), coloured and painted wood, turned wood, gilded wood, structural wood, archaeological wood, wood technology and wood sciences. An intensive and fruitful cooperation with this WG is anticipated.

- 3D-conform is an EU FP7 project that aims to advance the state-of-the-art 3D digitisation and makes 3D documentation an everyday practical choice for digital documentation within the cultural heritage sector.

The following COST Actions are of particular relevance:

- COST Action TD1201 “Colour and space in cultural heritage” (2012-2016) (Connections with this Action will allow access to new techniques to characterize the musical instruments. In return, this Action will allow TD1201 to access rare objects.);

- COST Action IE0601 “Wood science for conservation of the cultural heritage” (2007-2011). As mentioned previously, this Cost Action raised questions specific to musical instruments. This Action is partly in the continuity of IE0601;

- COST Action FP0904 “Thermo-Hydro-Mechanical Wood Behaviour and Processing” (2010-2014);

- COST Action FP0802 “Experimental and computational micro-characterisation techniques in wood mechanics” (2009-2012).

This COST Action will benefit strongly from the scientific achievements of these two later actions with regard to the fundamental knowledge on wood anatomy, wood chemistry and wood physics, including natural and artificial wood ageing, and the relation between structure and properties.

C. OBJECTIVES AND BENEFITS

C.1 Aim

The main objective of this COST Action will be to improve the conservation of our wooden musical instruments heritage by increasing interaction and synergy between wood scientists and other professionals (including instrument makers) applying wood science, curator, organologists and

makers towards the study, conservation and restoration of wooden instrument collections of artistic or historic interest, and to offer a novel and reliable, independent and global knowledge on these collections.

C.2 Objectives

The secondary objectives may be identified as follows:

1. The development of tools for the CH authorities, for the setting of the uniform cultural values (historical, aesthetical, acoustical, mechanical etc.) evaluations to define the object status;

2. To identify and to gather the community of end users in addition to the CH authorities (curators), such as makers associations, learned societies (musical instruments, organology, acoustics, etc.);

3. (a) To put into evidence how the modern scientific knowledge on wood may contribute to diagnosis and conservation of wooden musical heritage;

(b) To point out how the history of techniques may contribute to the understanding of the present state of this heritage;
(c) To take into account the specific context of cultural heritage object to improve characterization techniques;

1. (a) To favour meeting and interaction at both, scientific and practical level, of researchers in the field of wood and mechanics, specialists in conservation of wooden instruments and instrument makers which might successfully contribute to the history, diagnosis, restoration and conservation of wooden instruments;

(b) To promote the diffusion of knowledge to the public thanks to the development of pedagogical tools;
(c) To foster and stimulate the making of fac-simile objects thanks to the exchange with the makers.

C.3 How networking within the Action will yield the objectives?

The Action will provide the preconditions to stimulate close cooperation, information exchange, as well as a stable base for a fruitful knowledge exchange and coordination of research activities. The networking aspect of COST Actions is an important precondition for progress and success in such an interdisciplinary field with actors from the arts and humanities and technologically oriented scientists, with users and developers, with public institutions and instrument makers.
Institutions with specialists as well as scientific expertise and instruments for certain types of documentation will share their knowledge by hosting Training Schools (TSs) and Short-Term Scientific Mission (STSMs) for museums and other institutions dedicated to preservation of musical CH objects.

C.4 Potential impact of the Action

The key scientific benefit of the Action is the development of a strong network and a pooling of resources for complete research in the field of wooden musical instrument conservation and knowledge. A strong link between scientists specialised in wood science related sectors or in arts and humanities science sectors will be established and will provide a basis to continue the interdisciplinary research activities in the future. The Action will lead to a well organised research community with efficient communication channels capable of coping with and making the best use of the increasing exchanges. The established network of collaborations will promote knowledge transfer and broaden and improve the qualification of young scientists. The impact is anticipated from:

- (a) An enhanced understanding of the benefits of wood sciences in the heritage corpus documentation;

(b) A wider adoption of interdisciplinary sciences to give the end user (e.g. curators or instrument makers and/or experts) access to expensive bench tests;

- (a) The enhancement of the quality of research and the publications;

(b) The dissemination efforts which will result in enhanced communication between art and humanities and engineering communities;
(c) The improved communication between the wood scientists and the wood handicraftsmen in the specific case of the historical musical instruments;

- (a) Newly established collaborations which will promote joint submissions of innovative topics to future EU calls;

(b) Promotion of new interdisciplinary careers for Early Stage Researchers (ESRs) and training opportunities offered through their integration into the activities of Working Groups (WGs).
A considerable impact of WOODMUSICK activities is expected by means of an intensified usage and integration of engineering and wood sciences. This would greatly enhance the documentation and condition monitoring of heritage instruments and is likely to reveal qualities that were not accessible by earlier techniques. These could also benefit to contemporary makers.
Thanks to the network produced by WOODMUSICK, the organisation of a fac-simile competition will be made possible and promoted. Several multii-disciplinary teams will re-create, mixing all the knowledge, a disappeared instrument (to be determined).

C.5 Target groups/end users

This action aims at three target groups:

- Specialists in the field of Heritage Science and the Art and Music: museum, curators, organologists, ethnomusicologists etc.;
- Conservators and makers of historical musical instruments (e.g. instruments made according historical know haws and materials);
- Research and education stakeholders: R&D labs, universities, conservation schools, instruments making schools.

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

This COST Action aims to produce interaction between researchers in various fields of wood art and humanities sciences and mechanical researchers, who specifically deal with the conservation of CH. Such interaction will encourage and promote the above mentioned objectives.
Important innovative aspects of this COST Action, with the strong input from CH specialists include knowledge exchange in the following fields:

History of wood uses

Partners will be invited to collaborate with regard to the identification and dating of wood, in the aim of understanding wood trade at different periods, circulation of material and techniques, and

their link to the diffusion of tools and building methods. To enhance and develop knowledge on the different corpuses, comparisons of different artefacts can now be made more easily with the online database of MIMO. This tool allows now to find objects of the same nature belonging to different collections throughout Europe. Inter institutions and international programs will be made with respect to different types of musical instruments which would bring benefit to the different collections.

Musical instrument conservation techniques

The identification of historic restoration interventions is the preliminary step, together with a conservation report, for musical instruments preservation. Historic musical instruments are especially well suited to be subjected to transformations because of their continuous uses throughout different musical epochs, playing modes and “fashions”, involving structural modifications, but also prolonged stress on their fragile structures. During the time, they have been repaired or restored, some parts are missed and others have been replaced. This stratification of interventions (in addition to frequent damages resulting or not from them) represents a source for the history of that object and for similar ones. The documentation assures a permanent record of actions and a continuity of the musical instruments technical biography. Conservators will be supported by scientific disciplines in understanding the nature of deterioration and its causes.

Dendrochronology

This COST Action will stimulate the development of non-destructive high resolution scanners for in situ inspection of wooden musical instruments to, first, obtain dendro-data which can be re-used for further and/or complementary studies, second, identify datation, and, third, when it is possible, to identify “biogeographic” provenance. For that, it will be important to propose and promote a common protocol to obtain significant dendro-data (tree ring series representing the studied wood), to diffuse data and knowledge which may be obtained by applying “dendro-morphology” and "dendro-provenancing" techniques, to support further historical and technological studies.

Xylology

Conventional wood identification requires sampling in three anatomical orientations (transversal, radial and tangential ways), but this action can be too invasive or even destructive for certain parts of instruments. WOODMUSICK will have, first, to identify methods to access the information in the most non-intrusive and non-invasive possible way, second, to promote the development of portable techniques usable in situ to observe wood anatomy and, third, to involve qualified wood anatomists able to read and identify wood at a micrographic level (genus and species).

Wood science

Several domains of wood mechanical behaviour, which are especially important for the particular

case of wooden musical instruments, are still lesser-studied, e.g. anisotropic viscoelastic properties (both in acoustic damping and in creep) and thermo-hygro-mechanical couplings (out-of-equilibrium moisture dependence of “acoustic” properties, thermo-forming and heat-bent parts of instruments). Moreover, wood properties, even the most “basic” ones, are still often unknown for several species relevant in instrument making.

Natural aging, and notably its repercussion on “acoustic” properties, is another important field for future research. Cracks in soundboards and coating degradation (varnish, decorative details, etc.) are very common problems restorers have to deal with. Free or restrained hygro-dilatation of wood is partly responsible for such phenomena as was shown for other cultural heirtage objects (painting panels, furniture). Deterioration or irreversible damages of that kind reflect the history of moisture variations around the instrument, but might be also related to its initial mechanical state at the time the instrument was built or restored.

Wood optical aspect and wood coatings interactions

Very few studies have dealt until now with the optical properties of wood. Studying the diffusion, reflectance properties of wood are linked to its visual appearance, which can be striking in some types of wood, for example with the waves of curly (or “fiddleback”) maple. Multi-spectral techniques need to be applied for the characterization of these properties to understand the choice of the makers.

Mechanics

The method for inducing pre-stresses depends very much on the instrument category and the maker himself (e.g. one bar glued off-centered with a small difference of curvature from the soundboards one, bars on the soundboard rear-side most probably used moisture induced swelling of wood to put pre-stress into the soundboard). All these methods produce bending deformations, but these are not equivalent mechanically. A cooperation between mechanics and makers would give more details on fabrication procedures and allow to analyze these in terms of initial stress and strain. From that point, numerical modeling approaches can be set up to understand the long-term response of collection instruments, and assess particular restoration procedures.

Acoustics

An original instrument is not always kept in playable state (due to its historical value or due to its mechanical state). Moreover, the set-up and “fittings” of most “musically valuable” instruments have been heavily transformed in previous centuries to match the successive musical trends. In such cases, examination of the vibrational response of the main “vibrating body” is necessary to obtain information on a hypothetical sound. Moreover, this response is also an image of the mechanical state of the structure. To assess the vibrational behavior, in situ and non-destructive techniques will

be improved and developed for the diagnosis of the instruments.

D.2 Scientific work plan methods and means

The scientific areas constitute the basis for the formation of Working Groups (WG) in this Action as specified below. The scientific program and the required methods and instruments for achieving the objectives are presented in relation to the principal scientific areas. So far, main aims and tasks have been specified below. A more detailed description of the work will be developed at the kick-off meeting and will be adapted in the course of the Action. Other topics may be included then to accommodate disciplinary perspectives and activities not foreseen during the preparation of the proposal.

Scientific area 1*: Art and humanities sciences*

- Historical, ethnobotanical, sociological and archeaelogical approaches to wood uses in musical instrument making at different epochs
- Interaction with archaeologists in order to pursue a long-term vision of wood uses and exchanges, through the viewpoint of musical instrument making
- Analysis with present-day makers of their empirical perception (aesthetical, physical, acoustical) of a given wood for a given use – that could then be related to historical sources and/or to wood science approaches

Scientific Area 2: *Mechanics and characterization of wood*

- Mechancis and characterization of wood behaviour in different physical/mechanical domains, related to changes of properties and behaviour of wood and of wooden artworks (e.g. ultra-structural, physical and mechanical, chemical, rheological etc.)
- Non-destructive (micro samples allowed) and non-invasive methods and equipment for in situ and ex situ diagnosis and study of musical instruments heritage

Scientific Area 3: acoustics – re construction of wooden musical instruments

- Criteria and methodology for understanding, evaluating and keeping sound
- Methodology including simulation (finite element) and experimental tools (acoustical holography, directivity antenna...) to increase understanding of the production of sound by soundboards, to compare facsimile and original instruments and to evaluate the effect of environmental evolution on the instruments

Methods and instruments

The methods and instruments that will be employed in this Action are:

- X-ray Scanning Techniques, Small-Angle X-Ray Scattering (SAXS), Wide-Angle X-Ray Scattering (WAXS), (Micro) Computer Tomography, Synchrotron-based Tomography (μ-CT), Neutron Radiography/Tomography, Optical Coherence Tomography (OCT), non-linear Multiphoton Microscopy (MPM);
- mechanical testing equipment for conventional mechanical characterisation, ultrasonic test equipment, Dynamic Mechanical Analysis, (Electronic) Speckle Interferometry, Video Image Correlation for 2D/3D strain field measurement, Video Extensometry;
- Multi-spectral imaging: digital photography, infrared reflectometry, 3D laser scanning techniques, luminescence and reflectance imaging spectroscopy in the UV-Vis-NIR range;
- computational methods: finite element analysis, finite difference methods for physical modelling;acoustical equipment for recording sounds: anechoic room, directivity antenna, acoustical holography.

E. ORGANISATION

E.1 Coordination and organisation

The COST Action will be coordinated by a Management Committee (MC) defined according to "Rules and Procedures for Implementing COST Actions" (doc. COST 4154/11). The responsibility for the planning, execution, and documentation of the activities will be delegated by the MC to a Steering Committee (SC). This Committee will be a subgroup of the MC consisting of the Chair and Vice-Chair of the Action, the Leaders of the Working Groups, a nominated Website Manager, and when necessary others through appointment by the MC. In particular, the SC will assume responsibility for reporting to the COST Domain Committee, drawing up and controlling the budget, planning and preparing meetings and workshops, approving Short-Term-Scientific Missions (STSMs) and Training Schools, implementing dissemination activities, etc. The SC will report on its work in the MC meetings and will be bound to decisions made there. The MC will provide a platform for discussions about the scientific focus and the work programme of the Action. It will supervise and coordinate the research activities in the Action, draw up detailed plans, and track the progress in relation to the scheduled objectives. A website will be developed for the online dissemination of the activities and results achieved by this Action. The organisation of the cost action is depicted on the picture below.

E.2 Working Groups

As specified previously, three working groups will be established. For each WG a leader and a deputy will be elected to coordinate the work within the group and to represent the group within the SC. The participation of individual researchers in more than one WG will be possible and welcome for encouraging the information flow between the different groups. A close interlinking of the WGs will have highest importance for the MC and will be fostered by joint workshops and STSMs across different WGs.

E.3 Liaison and interaction with other research programmes

Some members involved in this Action have participated in European research projects such as 3D-COFORM and MIMO. So there is considerable scope for liaison and interaction. In addition to the exchange of information, joint seminars or workshops will be held.

E.4 Gender balance and involvement of early-stage researchers

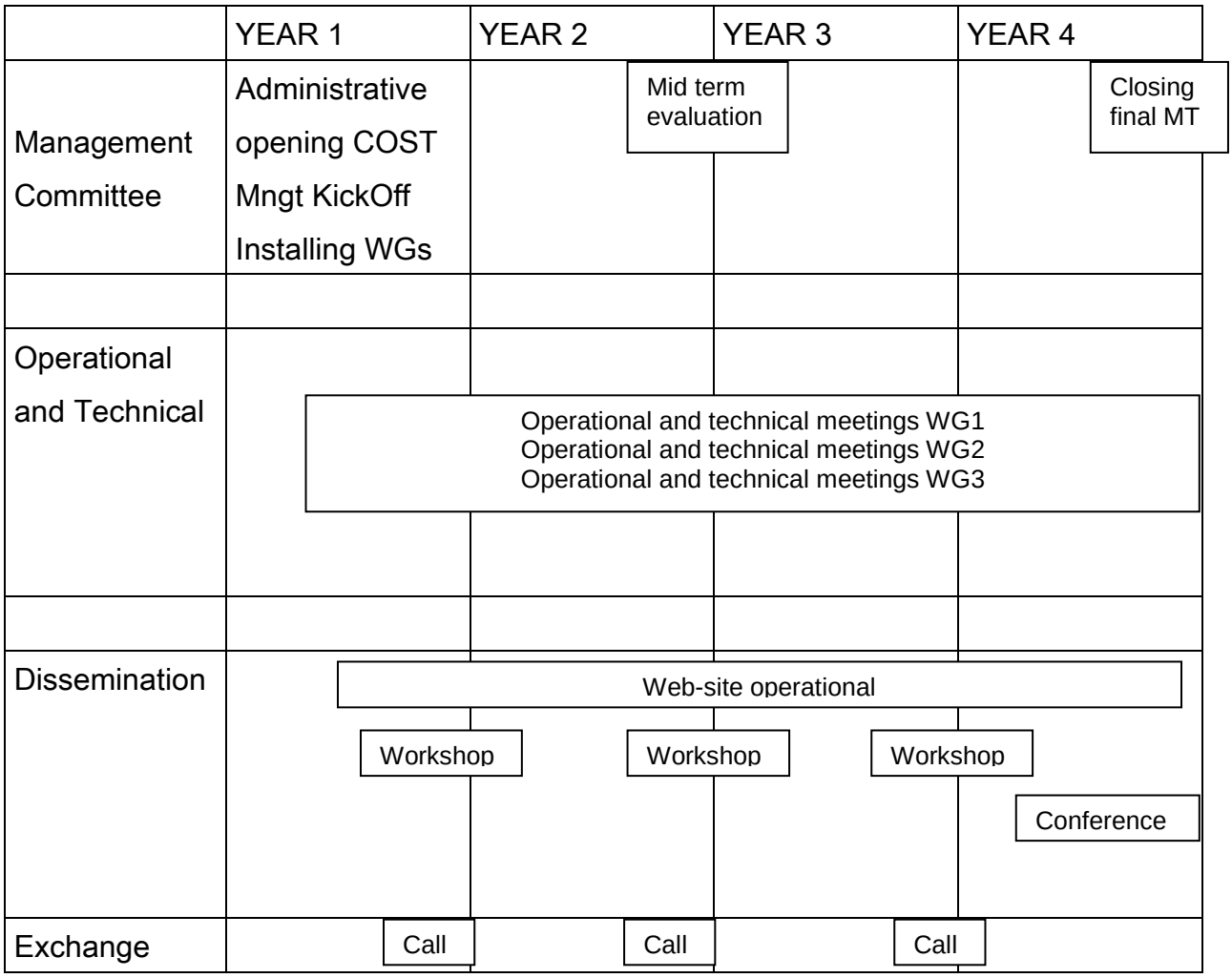
"This COST Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. The Action will also be committed to considerably involve early-stage researchers. This item will also be placed as a standard item on all MC agendas."
Involvement of young researchers will be encouraged by targeting at least 10% of the Action's budget towards the participation of young researchers to Training Schools and Short Term Scientific Missions.

F. TIMETABLE

The first MC meeting will be used for the initial planning and organisation of the Action, including SC composition as well as WG structure and composition. The kick-off meeting will be held within the first four months after the start of the Action. It will support the starting of efficient networking between participating labs and institutes, help the Action's community to identify itself and its research areas, make the Action visible to the outer world, and also attract new parties to participate actively in the Action.
The SC meetings will take place at least twice a year but as much as necessary. The MC meetings will take place once a year whenever possible in connection with annual workshop in order to minimise the costs for the coordination and to report news and decisions to the colleagues.

WG meetings will be organised at least annually to coordinate the research within the group and to stimulate scientific exchange. Moreover, state of-the-art reports and other publications will be decided and outlined there. Workshops will be held annually, including both plenary sessions for all participants and parallel sessions for the individual WGs. All representatives in the different WGs will be strongly encouraged to participate in these workshops for promoting an optimal exchange of knowledge and ideas.

A midterm review and public conference will be organised after the duration of about two years. At this review, there will be an internal evaluation of the Action and an assessment of the further research work necessary to successfully complete the Action. A final conference at the end of the Action will provide a suitable framework for evaluating the achievements of the Action and for discussing follow-up activities. At both, the mid-term and the final conference, the results will be presented to a broader audience. Leading academic colleagues will be invited to give talks on specific topics of interest during these conferences. Also instrument makers will be invited to join these conferences in order to disseminate results and exchange ideas.



Researchers (STMS)				
Training Schools (TS)		TS	TS	TS
Meeting Planner (guideline)	MC MC WG	MC WG MC WG	MC WG MC WG	MC WG

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: AT, BE, CH, DE, ES, FR, IT, PT, SE, UK. On the basis of national estimates, the economic dimension of the activities to be carried out under the Action has been estimated at 40 Million € for the total duration of the Action. This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

H. DISSEMINATION PLAN

H.1 Who?

The results of the COST Action WOODMUSICK will be disseminated to the following target audiences:

- The members participating in this Action;
- The end-users of WOODMUSICK Action: curators and conservators, instruments makers, higher education teachers and students, private collectors, governmental heritage agencies;
- Research institutions not involved in the Action;
- CIMCIM;
- Other important international societies relevant to WOODMUSICK activities such as the *International Society for Photogrammetry and Remote Sensing* (ISPRS);
- International Council of Museums - Conservation Committee (ICOM-CC);
- Students and early-stage researchers.

H.2 What?

The results of the COST Action will be disseminated to the respective target groups in the following way:

Action Members

- Password protected website,
- Meetings, workshops, conferences, STSMs, Training Schools,

Heritage specialists

- Training Schools,
- Workshops,
- Public website,
- Best-practice guidelines and papers,

Research institutions

- Public website,
- Scientific publications,
- Action Workshops,
- Presentations at national or international Conferences,

Makers

- Direct communication,
- Public website,
- Workshops

Students, ESRs

- STSMs,
- Training Schools,
- Workshops,
- Public website,
- Scientific publications,
- Teaching activities by Action members.

H.3 How?

The dissemination of the Action outcome will be critical for the success of the Action. Therefore, a website group as well as an editorial board will be elected during the Kick-Off Meeting, which will

be responsible for communication and publication of the Action through the above mentioned means. The Editorial Coordinator will be responsible for keeping in contact with all Action members and gather the information for publication. The Website Coordinator will set up and maintain the website, select and post the information online, and assist Action members in uploading their content.

The Action will also make use of one or more social networking services, to reach a maximum of the target audiences, make them aware of the Action, attract new members and disseminate the results. The type of online dissemination, the choice of social networking sites and the information to be published will be on the agenda for Kick-off Meeting and the MC meetings. Online publications will include the documents produced in the course of the theoretical and practical work, and tutorials or demos focused on systems, methodologies and protocols used for non-contact acquisition of materials. New dissemination opportunities, for example through new conferences, workshops, journals, trade fairs as well as new potential target audiences, will be constantly reviewed by the Editorial Manager. The dissemination plan will be modified accordingly, if necessary, during the course of the Action.