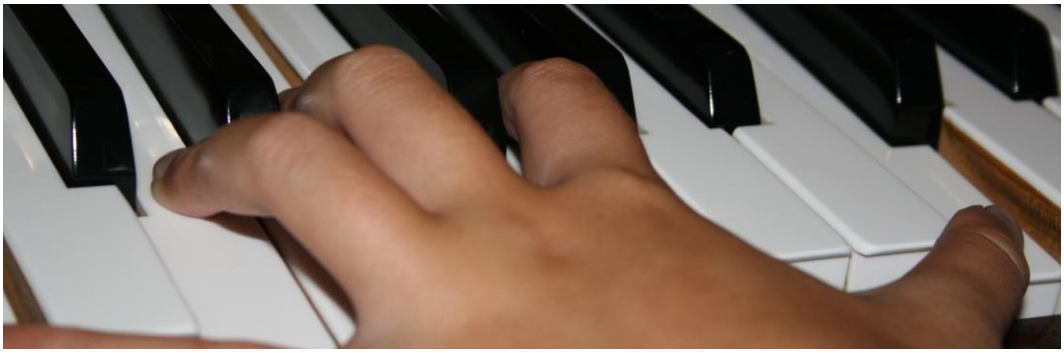
Lifelong Learning Programme

D5.2 EVALUATION ACTIVITIES



Mus4VIP project - Music for visually impaired people
LLP - KA3 ICT: Multilateral Projects

D5.2 Evaluation activities

Transversal Programme:
Mus4VIP project: Music for visually impaired people
LLP - KA3 ICT: Multilateral Projects
Project N° 530990-LLP-1-2012-1-IT-KA3-KA3MP
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Deliverable information:

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Author: Wp 5 coordinator: Helena Jakubowska EKMS, with the help of Pierantonio Garlini Irifor, Francesco Facchin Cons, Nadine Baptiste UT2J, NCW	
Abstract:	Following the evaluation plan, we have involved target users, distributed questionnaires and summarised the data gathered for each country. The first deliverable draft reports all data collected according to the protocol defined in the evaluation plan, in a statistical form. The document has circulated among user groups, who are asked to comment on the results achieved. In addition to statistical data (included in an annex), the final deliverable reports a complete description of the testing and evaluation activities, in the form of publication, with comments on the results achieved and indications about necessary corrections and adjustments, concerning both the proposed pedagogical model, also with reference to tools, lessons and the proposed online service..
Keyword List: Blind, music, education, computing, Internet, difficulties with existing systems, Braille music, Evaluation	

Executive Summary

Once the experimentation activity is over, whether led by teachers with their own students, or, in the case of self-learners, at the end of the independent learning phase, the consortium partners made contact one last time in order to fill in the satisfaction questionnaire that is the defined evaluation in the D5.1 plan with V4.

In the D5.1 evaluation plan you can find the criteria and the general building plan of the whole evaluation activity which was defined for the project's resources, experimentation and testing phase. The evaluation phase provided four phases called fromV1 to V4 which provide as a work tool the same number of questionnaires named from Q1 to Q4. Therefore, it is necessary to postpone to D5.1 for further information on the structure of the whole evaluation planning.

Q2 was mainly carried out by phone and the partners then, in most cases, summarised the conversation in the questionnaire at a later time.

The questionnaires were gathered in the month of December and sent to the project coordinator partner which is the Conservatory of Padua.

Once all the data were gathered, they were worked out again by the WP coordinator partner in a statistical form.

Tables of contents

1. The Mus4VIP Project

The Mus4VIP project aimed to develop the best possible use of new technologies in the field of Braille music, so as to prevent further disadvantage to visually impaired people and in order to reverse the dramatic decline in music literacy among blind people. In recent years there have, in fact, been signals (New York Times articles by Rachel Aviv, Published: December 30, 2009) of a serious return to musical illiteracy, due to the fact that new basic technologies (I-Pad, smart phones, and similar technologies based purely on listening), have discouraged the visually impaired from learning Braille, offering them the easy, but inferior, alternative of relying on learning by ear. This method is indeed very easy to implement; in fact today, the Internet allows the retrieval of almost anything, as well as offering immediate results. On the other hand, as we point out in all our documents, it is also known that learning only on the basis of listening tends to limit the ability to conceptualize learning contents. In fact, hearing / listening recalls written symbols in those who are literate, while, for those who are not literate, it does not produce concepts, but only labile shadows in the memory, which cannot easily be refreshed, corrected or enriched, through the continual, flexible and personal reference to a written source. This turns out to be a very significant obstacle to genuine education, and denies the principle of equal opportunities.

Mus4VIP sought to overcome these problems by exploiting the best of available resources, both in terms of the functioning senses (touch and hearing), and the best possible use of existing technology based on these two senses.

Mus4VIP has therefore drawn maximum advantage from the sense of touch, which offers the only true means of achieving real literacy for a blind person. The sense of hearing, instead, gives an "overview" of a musical score but, crucially, it does not allow the same degree of accuracy in examining details. With regard to the available technologies, Mus4VIP has combined the use of tactile devices, such as Braille display and Braille embosser, with acoustic devices, including sound cards and speech synthesis.

The outcome of this has been to promote Braille music literacy, because hearing and touch have proved to be capable of supporting each other in the complex process of deciphering and comprehending music as a language.

In particular, the project achieved the following results:

- Developed an educational methodology that has proved to be more attractive for students and has proved to be an effective support for teachers in the field of accessible music.
- Offers the opportunity to develop training materials in a collaborative way, taking into account knowledge and understanding of the cultural differences between the various participating countries. In fact, each country has developed its own local Braille language, with small, but significant differences; the project has considered this aspect, by collecting and systematically organizing the differences between countries.
- Helped young visually impaired students to develop a more attractive and accessible method for studying music, bearing in mind what an important contribution music can make to an individual’s intellectual and psychological development.
- developed appropriate tools in order to help new generations of teachers, teaching assistants and lecturers to acquire specific basic skills in the area

of accessible music, by offering them powerful resources and workplace opportunities, both in special schools and in institutions devoted to training the visually impaired.

- Has developed, tested and disseminated new teaching models in the areas of Braille music theory, reading and writing, based on the use of new technologies.
- Created a collaborative process among schools at European level, aimed at improving both basic training and services for music teachers and other categories of people working in schools, such as teaching assistants for visually impaired students. The purpose of this collaboration is to exchange experience, with a view to developing new teaching strategies aimed at improving music teaching quality and the use of Braille both in schools and special institutes, particularly in those classes with one or more visually impaired students.
- Developed a guide to the use of available computer tools that will meet the training needs of teachers at primary, secondary schools of theoretical and practical subjects in music conservatories and music high-schools, taking into account the conditions in each participating country in terms of school integration and education provided by special institutes.
- Has activated a very promising dialogue with projects and networks that operate similar themes
- Has improved the quality and European dimension of training for teachers of visually impaired students;
- Has promoted the development of resources, services, pedagogical solutions and innovative practices based on IT in the field of permanent learning.

2. Evaluation targets

The aim of this evaluation report is to report feedback from teachers, students, parents, self-learners and other users after the planned testing activity has been completed.

On the basis of the information collected, we would like to improve the quality of the learning resources already available on our web portal.

In particular, the following main factors have been taken into consideration:

Which resources/materials were used most frequently?

What activities were most commonly undertaken by users of the Mus4VIP Project: didactic units, conversion/transcription of scores, composition, arranging, use of reference resources (such as index of Braille music symbols) etc.?

What are the advantages and disadvantages of the website (with reference to learning time, organisation of didactic units and availability of resources)?

What changes are suggested by the interviewees?

What are the most urgent needs in the area of music education for the blind that have not been fulfilled so far?

3. Methodology

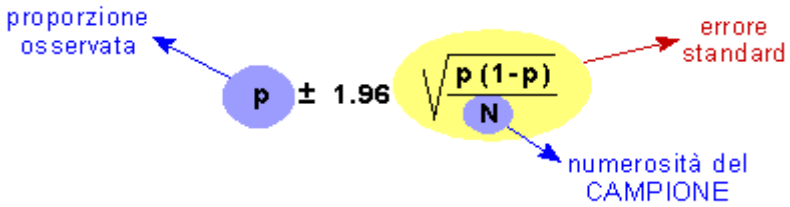
Some considerations are appropriate on the sampling for the purposes of the statistical observations that we are going to do:

It would be easy to assume that the quality of obtainable results (for example, a survey's results) depends on the number of persons that compose the sampling itself and not the way that they were selected. The weakness of this assumption has been demonstrated (Cochran, W.G. (1977) Sampling Techniques, Wiley. - Cicchitelli G., Herzel A. Montanari G.E. (1997), Il campionamento statistico, Il Mulino, Bologna, seconda edizione. - Sarndal C.E., Swensson B., Wretman J., Model Assisted Survey Sampling, Springer-Verlag, New York, 1992)

Another common assumption is that the sample size must be proportionate to the size of the studied population. The rules of statistics demonstrate, instead, that this assumption is completely wrong. For example, the intention to do a survey on the inhabitants of a small city rather than of a large city or even on the entire Italian population does not affect the number of people necessary to get a representative sampling. (A. MIRA, Temi Avanzati di Statistica, Varese, 2005)

In conclusion, contrary to what intuition might suggest, a sample of 1000 people, can, if chosen with an appropriate way, represent with the same reliability and limits, the population of a city with 100 thousand inhabitants, or of an entire area with 2 million inhabitants, considering that the margin of error, due to sampling, will always be less than 3%. On the other hand, the standard error of a proportion is in an inverse relationship to the sampling size, but it does not depend on the number of the studied population. As a matter of fact – in the calculation of the

confidence interval 95% of a proportion, the size of the population from which the sampling derives is not considered because we refer to the general model which is the Normal Casual Variable also known as Gaussian.



Applying the above mentioned formula, we can attribute with relative adaptations to Gauss, whose formula allows us to calculate the confidence level of 95%, we verify the statement according to which the margin of error with a 1000 unit sampling is below 3%.

We suppose that p=0.5, that is the proportion of elements with a determined feature in the sampling is 50%. Applying the formula, we get that p = 0.5 ± 0.031, that is 50% ± 3.1%.

In this case in which the variance in the population is maximum (p = 0.5); in other cases, the margin of error proves to be even lower. For example, with p=0.25, l'I.C.95% è 25% ± 2.7%.

It is quite natural that, before beginning a statistical survey, we must understand how many “interest units” must be examined in order to get with sufficient reliability, the desired aim.

This is one of the most delicate parts in the survey planning. Obviously, the larger the sample the more precise and reliable the results will be, provided that the sample was selected with a correct method. Larger samples are more expensive because they need commitment with contacts and a proportionally larger data collection.

This is true in part, even though the cost also depends on other elements:

1) Typology of the sampled population that can be of a common type and then a large number, and of an easy availability, or of a sector type which

requires a more complex identification and contact system.

2) Whether the samples were distributed in the territory in a concentrated form or distributed on a larger scale.
3) The way in which data are collected, whether by face to face contact, telephone contact, newsletter, website or online system as a do it yourself questionnaire.
4) The availability of contact information for appropriate respondents. Where this is not easily available the survey activity must also take into account the estimated cost of obtaining it.

The Mus4VIP project sampling considered all the 4 elements above mentioned. In fact:

1) It is not a common sample but composed of teachers and musicians, mostly specialised in the training of blind students. So, this is a difficult sample to identify and to contact.
2) The teachers are distributed on a large territory, that is the national territory, certainly not concentrated in limited geographical areas.
3) The contact cannot be made simply inviting the users to enter a web portal of data collection, but a personal contact is needed, and that is the reason why the telephone interviews were largely used.
4) Lists of music teachers for blind students do not exist but the teachers have been found in many different ways and asked personally for e-mail or telephone contact.

So, on the basis of the various survey criteria, it is always necessary to accept a compromise that allows for the numbers and the method of selection of the users' sampled.

We use these general observations now in the sample analysis to use for the Mus4VIP project and we carry out our considerations, by way of example, for the Italian situation.

In Italy, there are 600 totally blind students (age from 6 to 18), excluding individuals with low vision at any level, students with further disabilities and only considering those able to read in Braille, as from the survey carried out in the D7.1 deliverable on the exploitation plan. This figure is arrived at in an inductive experimental form, because no published surveys exist. Therefore, it is a value estimated on the basis of interviews with those who sell aids and school programs in Braille for blind people. A similar value (7-800 units) was also given by dottor Barbuto, president of the Italian Union of the Blind and Low Sighted, when consulted by us. President Barbuto based his figure on the demand for transcriptions of school books provided by the blind national library.

We refer to D7.1 for a long analysis that defined this data in an experimental way.

Among the above mentioned blind students, it is possible to affirm that currently, 40 of them are attending a conservatory or a music high school and studying music to become professionals. A considerably greater number of users are are studying music for passion or in an amateur way which means without a structured course. It is possible to say that students in secondary schools attend at least two hours of music a week. The number of teachers is equal or probably lower than the number of students attending courses at conservatories and music high schools.

Specialised teachers are really rare and the trend shows that, where a specialised teacher for blind students is present in a conservatory, they usually become teachers of many blind students.

In order to have such a teacher, blind students will frequently travel from neighbouring towns to take lessons at the conservatory. There are also instances

of conservatory teachers that are blind.

The number of teachers training blind students grows if we include the secondary school music teachers who, as distinct from those mentioned above, are sighted and rarely specialised in Braille music.

The category of teachers at which we look first is that of the conservatory music teachers who give individual lessons to single students, to music high school teachers, to secondary school teachers and to support teachers for disabled students. The numbers of the sample can be composed of 40 specialised conservatory teachers with the aim to reach 200 units if we consider the students at secondary schools (that is between 11 to 14 years old). Considering these possible sampling values, it was decided that 10 teachers represent in our Italian example, a value which is almost 5% of the population. So they have a precise statistical relevance.

For each of the four countries, at least 10 teachers were found and in addition a teachers' group from countries such as Spain, Germany which got in touch with the project. There were 52 teachers.

A further demonstration of the low numbers, especially concerning conservatory teachers or Braille music syntax experts in music high schools, is given by the fact that in several consortium meetings via Skype, there were discussions of the difficulties in finding teachers already expert and specialised, as well as securing their availability to take part in the Mus4VIP project experimentation.

Considering such difficulties, it was decided to include also a self learning activity, as well as study assistants and also support teachers of blind students in inclusive schools.

In view of the extremely high specialisation of the teachers and the fact that they are all engaged in the same professional activities – reading, writing, teaching and playing music - regardless of national boundaries, the sample group interviewed in the four countries representing the consortium partners, were analysed in a global form as a single sample.

In order to increase the number of interviews and users, also considering the difficulties shown by the consortium in finding potential users to interview, those who contacted the project using the contact form on the project portal were also asked to participate in the project. As a result the project got in touch with a group of teachers from Germany (Koln Blind Institute), German speaking Switzerland and from Spain (ONCE teacher in Barcelona) reaching a total number of interviews of 52, among teachers, study assistants and self-learners.

4. Description of testing and evaluation activities with comments on the results achieved

4.1 Questionnaire for teachers

Personal data: the Q4 was the final one and the number of teachers interviewed is similar to that of the previous questionnaires (see Q1, Q2, Q3) that is the number of 52 (including the self learning users).

1) Extent of experimentation period:

Note: an average of 20 days (a certainly valid period for an effective experimentation)

Description of the activity performed during the experimentation phase.

2) Please give a short description of the activity performed during the experimentation phase.

Note: there are many descriptions which cannot be standardised, but all were

taken into account. Here you find a significant sample:

“Anita, 13 years old, attends music studies (2nd year in piano). Anita is familiar with literary Braille but not quite with music notation. Main goal of experimentation has been to improve her level of motivation in learning not only by ear, but using also music scores in electronic format, including Braille, spoken music.”

Learning of solfeggio (a really challenging basic activity especially in the Italian schools)

Learning a new music score for piano exploiting the options presented by the software, studying the right hand and the left hand separately, reducing the size of the score by filtering out elements of the music which are superfluous in the first memorising phase.

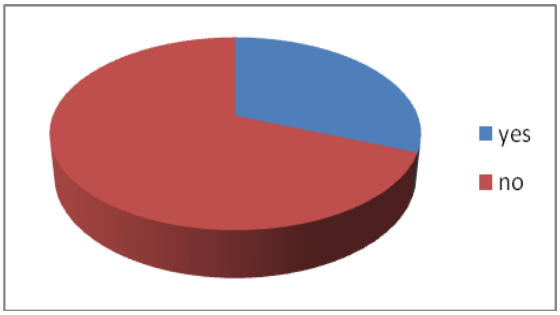
Learning a Braille score for singing.

Learning new elements of music theory and at the same time the Braille symbols using the theory manual within the portal.

Practising passages of a score, with the potential to access study exercises produced by the teacher, especially exercises of a technical nature to improve those passages. For example, studying rhythmically varied fragments in a simplified form separating different voices, or chords.

3) Did you develop in written form, and use your own didactical material for the purpose of the project?

Note: Yes: 31% No: 69%



Only one in three have created their own teaching unit in written form, a lot have designed their lesson at the time. Some of the lessons made in written form have been authorized to be available on the portal

4) Did you use any of the units available on our web portal?

yes 83% no 17%

Note:

Once again it is clear that the use of the tools made available by the site, has been appreciated and significant. Among these, the conversion system from MusicXML to Braille, the theory manual, the acoustics manual, the database with the Braille symbols, the didactic units and the tutorial.

5) Please indicate what you consider to be the strengths of such didactic units in comparison with more traditional methodologies?

Note:

This question is the characterising one within the whole questionnaire, where the

Mus4VIP project's strengths emerged. Here we report some answers that synthesise the most common ones, knowing that the questionnaires and telephone conversations were summarised by the interviewer.

1. An electronic score is more flexible than a traditional paper score. This means that the student can always choose the level of detail that he or she wants to read in the score, and can choose which tool / tool combination they employ, such as Braille paper, Braille display, voice synthesizer, or direct listening.

2. An electronic score is more portable.

3. Translation from the normal score into Braille is more immediate and requires less training, in comparison to traditional transcription methods.

All the people interviewed, were well aware of the potentials of Braille music, when it is in an electronic format rather than in a paper one.

- In terms of flexibility for the teacher who can have a more powerful working tool,
- Encouraging and simplifying the learning of the Braille syntax which is acknowledged to be difficult and complex to remember and to read.
- As a tool to speed up the storing of music
- As the only possible solution for an exchange of information between blind and sighted people and vice versa (for example, in composition classes), leading to less isolation of the Braille user.
- As a solution for independence, particularly if the music teacher is not a Braille music expert,

It is also necessary to mention that some people emphasised that it is not enough to have the tools, but that examples of didactic proposals are also needed in order to provide models and templates for users' own didactic resources. That is the aim of the Mus4VIP portal.

6) For each aspect of BMR or BME2 listed below please give a satisfaction rating between:

1 Insufficient

2 little

3 satisfactory

4 good

5 very good

	1	2	3	4	5
Easy to use			5%	37%	58%
Easy to learn music (easiness and speed)			3%	28%	69%
Fast to learn the operation of the software			13%	44%	43%
Easy to install				20%	80%
Management with the Braille display			12%	12%	76%
Management with the screen reader				10%	90%
Management with the MIDI music playback					100%
Clarity of spoken music via voice of the screen reader				10%	90%
Clarity of the reproduction of the notes through the sounds					100%
Easy to hide / show elements (fingering, parts, voices)				22%	78%
Clarity and understanding of the reading of the reduced text					100%
Element searching			20%	30%	50%
Entering of remarks			35%	22%	43%
Customisation of the score				35%	65%
Easy to remember the shortcuts (hot keys)			15%	30%	55%
Instruments to select the score to be played (single bar, the whole score, etc.)				30%	70%
Management of very long music scores				60%	40%
Search for a particular point in a line				40%	60%
Search for a particular point in the text (a particular measure, switching between the parts)				30%	70%

Understanding, via the screen reader or description on the status bar, of music symbols never used before.			20%	25%	55%
Clarity of the BMR manual and other documen relating to it.				30%	70%
Completeness of the manual and other documents relating to Braille Music Reader/Braille Music Editor				30%	70%

Note: it is clear and positive for all the considered aspects.

7) Do you believe that BMR is a valuable tool to assist your students while exploring Braille music text?

Note:

Yes, highly valuable	90%
To some extent	10%
Of no value	0%
Quite valuable	0%
Of little value	0%

8) Have you any additional comments?

The additional comments included such things as what further developments people would like to see; suggestions for promoting a wider spread of the portal resources and above all, a comment that has become the “leitmotiv” of all the teachers’ observations, requests and suggestions as to where to find digital Braille material that can be made available as Braille music files in the BMML electronic format

4.2 Questionnaire for students/users

The students' questionnaire was gathered through the teachers' cooperation. The collection was made in a different moment than the previous in order not to have the data influenced by the teacher's opinion.

That was necessary because there are some existing and objective issues about getting in touch with the students or receiving the parents' authorisation with the aim of carrying out the interviews with the students. The teachers were therefore asked to act as a medium with the students and also with the parents for the filling of Q4.2 and Q4.3.

The aim is to check whether the teachers' opinions are shared by the students and if they met different difficulties which did not emerge in the teacher's interview. Notice that the questions were reduced to an essential form and the voting formula of the statements were widely used, in order to reduce the filling times and the inconvenience towards the teachers who gave their availability. The questionnaires were 50 with the exclusion of those listed as self-learning.

1) What is your opinion of the materials offered by Music4VIP? List the materials used and give your personal impression.

Note:

The answers to this question were mostly somewhat perfunctory, the respondents either simply writing "yes" or listing the scores they had studied (theory, piano score).

All of those who tested the theory manual, used it directly from the web portal also evaluating indirectly the accessibility of the portal itself, considering that any access difficulties were underlined. A student would like to thank Ms Eliana (the interviewer) because she introduced her to this new world of music in electronic format. 40% of the teachers consulted the user's tutorial for the BME2 program.

2) What was the impact of the material implemented by your teacher or used at your choice on your music activity?

Note:

The answers to this question varied from a simple "I easily learned" to the description of what was used. Here is a list of the significant data that emerged:

The majority of the students underlined that the most interesting features of the project's work are:

- That they can work with much greater independence
- The opportunity to have many new scores,
- The usefulness of being able to exchange musical materials with sighted people.
- The fact that they now have an application in which they can write and edit music, just as their classmates are able to do with programs such as Finale or Sibelius, .

- The usefulness of the screen reader which makes it much easier to navigate in the electronic score than the paper one. It is known that many students, reading a paper score and not recognizing the Braille music signs, are not able to go ahead in the reading and they stall. With an electronic file, this does not happen anymore because all the signs (passing over the cursor) are read by the screen reader and this is helpful.

A student highlighted the ease of avoiding Braille writing mistakes because it is possible to have a MIDI and a written text feedback and also because the screen reader reads all the signs immediately after the input.

3) What were the difficulties/obstacles you came across when implementing new techniques?

Here you find a review of the most significant answers:

- A group of answers corresponded to the answers to the previous question. Those who underlined the ease of transcribing from Braille to printed format and vice versa, had clearly found music files on the web, facing the many limits imposed by copyright and by the fact that there are a lot of PDF and MUSICXML files plus websites that are not accessible and ones that charge for their scores. Many websites are dedicated to graphic music and have scant regard for accessibility requirements.
- Some teachers use handwritten examples and therefore it is important to find third parties able to transcribe them into the MusicXML format in order to use the Braille transcription service on the Mus4VIP portal.
- These are solutions that should be adapted to promote a distance education.
- There is a lack of electronic Braille solfeggi and in general the most widespread complaint is the great scarcity of electronic materials in

Braille.

- These programs are known by the users but scarcely known by the teachers.

4) What were the advantages/benefits?

The answers corresponded to the others of the same group or with the teachers' answers. Here you find a synthesis of the issues which affected the students:

- Ease of understanding the music text thanks to the screen reader
- Use of the MIDI music playback to ease the learning (especially for those who have the perfect pitch)
- Swiftness in the text research, screen reader that suggests the symbols which are not remembered, swiftly scrolling the text compared with the bulky Braille books
- The tutorial was useful for learning the BME2 program
- Writing, correcting several times: it is really useful to be able to edit material, correcting mistakes or producing new versions.
-

5) Is it better / more convenient, in your opinion, to use the traditional media (paper copies, voice guidance) or implement IT? Or would you perhaps like to use a mixture of these approaches while learning music / working with music?

The advantages in replacing the Braille paper format Music in an electronic one are:

- The potential to transmit information through e-mail,
- The possibility of editing the text with corrections, additions and notes:

"Compared to the paper, I am not able to put in any comments, notes, change of fingering. Previously, I had to write the new fingering with a note on the Braillesense or PC while now I directly write on the score and I remove the original that I do not need anymore"

- It is very helpful to have the MIDI feedback as well as the screen reader for confirmation of what has been written.
- Removing the unwanted elements before storing the music and that is possible only with the Braille music in an electronic format. For this reason, an answer lingers on the solfeggi in this way: "Sometimes the paper is useful, for example for the solfeggi even though is useless in a Braille solfeggio to copy all the dynamics signs, nuances stretching the text and reducing the reading speed. The notes are sufficient considering that in the solfeggio the speed reading is prevailing on all the rest. With the BMR is possible to remove all the things in excess."
- One person makes the point that paper text is important in the early stages of music studies but it is clearly much less useful at a more advanced level.
- On the distance training, here you find a student impression: "I think that now is easier to have a distance training using SKYPE. At the moment, the teacher also writes me the things to do via SKYPE while previously with the Braille books I lost the sign, and also a lot of time searching it. I think that the theory manual and the other tools are excellent for the distance training, which is important considering that I live far from the city and it is a problem to be accompanied every time.

6) For each aspect of BMR or BME2 listed below please give a satisfaction rating between 1 (the lowest) and 5 (the highest). Please leave blank any row that does not apply to you

1 Insufficient

2 little

3 satisfactory

4 good

5 very good

	←	Little		a lot	→
	1	**2**	**3**	**4**	**5**
a. Easy to use			15%	20%	65%
b. Easy to learn music (easiness and speed)				40%	60%
c. Fast to learn the operation of the software		10%	25%	40%	25%
d. Easy to install				70%	30%
e. Management with the Braille display			25%	60%	15%
f. Management with the screen reader			20%	40%	40%
g. Management with the MIDI music playback				30%	70%
h. Clarity of spoken music via voice of the screen reader				40%	60%
i. Clarity of the reproduction of the notes through the sounds			15%	30%	55%
j. Easy to hide / show elements (fingering, parts, voices)				40%	60%
k. Clarity and understanding of the reading of the reduced text				35%	65%
l. Element searching			15%	35%	50%
m. Entering of remarks		20%	30%	30%	20%
n. Customisation of the score			40%	40%	20%
o. Easy to remember the shortcuts (hot keys)		40%	30%	15%	15%
p. Instruments to select the score to be played (single bar, the whole score, etc.)				60%	40%
q. Management of very long music scores				50%	50%
r. Search for a particular point in a line			30%	35%	35%

	←	Little		a lot	→
	1	**2**	**3**	**4**	**5**
s. Search for a particular point in the text (a particular measure, switching between the parts)			30%	35%	35%
t. Understanding, via the screen reader or description on the status bar, of music symbols never used before.				40%	60%
u. Clarity of the BMR manual and other documents relating to it.				45%	55%
v. Completeness of the manual and other documents relating to Braille Music Reader/Braille Music Editor				45%	55%
w. Give your comments.					

7) How do you think you will benefit from the new opportunities offered by IT and music specific software to develop your musical knowledge and skills?

The answers differ according to the type of student. For those who study in private or with individual lessons, the main benefit is the possibility of having a dialogue with the teacher via an e-mail exchange. Other reported benefits are those of having a greater exchange with schoolmates and especially being independent in introducing the works for theory, harmony and composition, considering that it is no longer necessary to make a transcription from Braille to printed format.

8) Do you believe that BMR is a valuable tool to assist you while exploring Braille music text?

60%Yes, highly valuable

40% Fairly valuable

0% To some extent

0% Of very little value

0% Of no value

9) If you have tried Braille Music Reader, did you notice any improvement in:

Rate from 1 (little or nothing) to 5 (a lot)

	←	Little		a lot	→
	1	**2**	**3**	**4**	**5**
a. Speed in understanding the music			30%	50%	20%
b. Confidence with the Braille music			40%	40%	20%
c. Greater understanding of the phrasing or musical sections				30%	70%
d. Detecting/correcting errors in the score				30%	70%
e. Music text navigation			30%	30%	40%
f. Self-confidence, self-esteem				20%	80%
g. Interest in music, motivation				20%	80%

10) Have you any additional comments?

The additional notes are in many cases of a generic appreciation, as shown below:

- I think that it would be a good idea for the portal to introduce a course based on complete audio lessons to learn Braille and the music with examples made with BME2 and BMR. It would be helpful.
- I think that specific courses at school on these issues are needed. We have music technologies subjects but it is all made for sighted and I stay in class in vain. It would be helpful to have music technologies closer to the project in order to have a benefit.
- I am already interested in children's training and I saw that the tutorial for the youngsters is really useful and easy to manage. So, if I should train, I would use the paper and then the BMR as a first studying tool.
- Training courses for the teachers would be helpful or using the students, computer skilled, as tutors for other students.

4.3 Questionnaire for parents

The parents were contacted through the teachers. It would not have been possible in any other way both because we do not know the students' names, for reasons of privacy because they are under 18, and also due to the lack of the parents' contacts. Not all of the teachers had the opportunity to have a contact with the parents. In the collection of the questionnaires, the self-learning students and those who preferred their parents not to participate are not included. This is the reason why the number of questionnaires collected was 60% compared with the number of students involved in the 4.2 questionnaire.

The number of questions for the parents were reduced to four leaving freedom to them to express their impressions. A certain difficulty in filling the questionnaires by the parents was reported and that shows that not all of the parents are so expert in the aids and tools used by their children. The target of the parents' questionnaire was however achieved because 70% of the people interviewed appreciated the work independence of their children when using the new IT proposals.

1) **Did your child ask for help/support in order to use new IT tools? If so, who provided the help?**

30% answered that they helped their child in the installation of the program while the others did not receive a support request.

2) **Do you think your child was satisfied with new learning tools, or did you find he/she would need more instructions or longer learning time?**

To summarise, 30% said that the system, in their opinion, requires long learning times but that then the study work becomes faster. 40% said that their child had support from the teacher and that the shift to the new system was quite fast, the remaining 30% was not able to express an opinion.

3) Do you think it is more difficult to find electronic music scores than traditional hard copies?

60% were convinced that it is generally difficult even to find scores that are already available (that is the traditional paper ones) and that the difficulties only increase trying to find electronic ones. 20% said that the existing printing offices should also produce texts in an electronic format while the remaining 20% were not able to answer.

4) Have you any additional comments?

In this section we recorded:

1) Appreciative remarks about the project.
2) Further training requests on various project issues (MIDI functions of BME for example).
3) Enthusiasm for the new opportunities that the project enables users to experience
4) Welcome for greater inclusion that the project promotes
5) Support for the argument that computers can offer more than the traditional systems.

5. Evaluation of conversion modules from MusicXML to Braille

This evaluation activity asked user groups to assess the accessibility of the portal, the usability of the conversion modules, the quality of conversion with respect to a collection of test cases proposed by users themselves and an assessment of the resources that are downloadable from the portal.

This part of the evaluation has been covering technical aspects, particularly accessibility according to portal standards, and conversion quality with reference to a protocol of examples found in the international manual of Braille music.

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5.1 General observation

BME2 and BMR are software applications designed to write and read music in Braille. BME2 acts as a text editor with specific functionality, including music. It is currently one of the most highly developed products in this field and includes features of great versatility, making it one of the most useful programs for blind musicians. Thanks to the conversion modules on the Mus4VIP website it gives the possibility to export files created by different commercial music editors, which the user can read, navigate and modify in full independence. This allows the blind musician to communicate independently with colleagues who read in "print", that

is who use printed scores. The same happens with the program BMR (Braille Music Reader), which includes all the functions of BME2 except for those related to the writing of music.
Import and export of these files is possible thanks to the spread of the MusicXML standard, which allows communication between different music software applications. This standard is still under development and, to date, does not include all the necessities related to music notation.
The analysis below includes import and export modules, as well as other important functions.

The main reference for our test is the New International Manual of Music Notation. Our test is generally based on compositions by Johann Sebastian Bach and by Leopold Mozart, downloaded from the Internet, made available in complete score and also in separate parts, which have been produced using Finale, and afterwards saved in MusicXML format and then converted to BMML and after imported using the program BME2 and the program BMR. In some cases we chose different pieces, also downloaded from the Internet (copyright free); furthermore, we realised specific examples, which will be duly mentioned.
The interface is fully accessible. The programme suggests the following steps:

Now you can convert a MusicXML file into a BMML file. This means that now your MusicXML file in BMML can be opened using BME2 or BMR for Braille reading.

How do I...

- Press "browse" button.
- Select the MusicXML file you want to convert.
- Press "upload" button.
- The programme will show the list of parts of your MusicXML file.

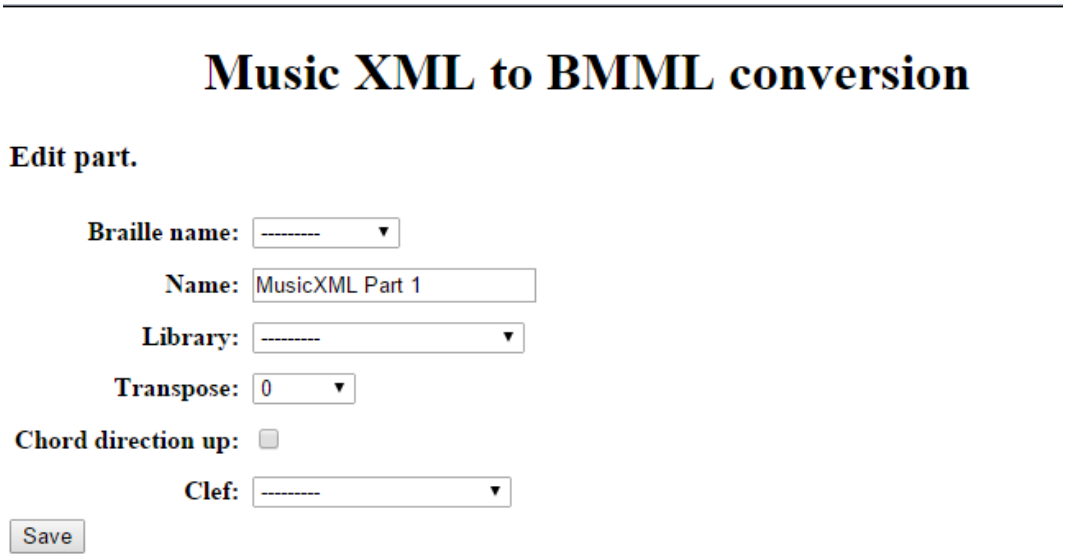
- At this point you must select one part at a time. You will then have a window where you must specify some characteristics of your part, such as: instrument, transposition, chord direction and clef.
- The same operation must be repeated for each of the parts. You can also skip step 5 and 6. In this case the program will use default values. For example, chords will always be represented starting from the highest note.
- Press "convert" button.
- Wait until you see the message "download converted file". This may take some time if the file to convert is big.

The interface for importing a MusicXML file is simple and clear. You have to press the "choose file" and select the desired file. All you have to do then is to press the "upload" button to upload the selected file.

After you have uploaded your file, you will see following page.

Once you select a specific part another window appears which allows the user to complete the information necessary for proper Braille representation. In particular, the user has to specify the following parameters:

- Braille Name (the name of part : right hand, left hand, flute, voice etc etc)
- Name (the name which appears into bar Braille)
- Library (from this menu appears list of instrument)
- Transpose (if it is necessary)
- Chord direction up (it is necessary specify direction of chord in order to have the right representation)
- Clef (type of clef: G, F, C etc etc)



Here are some examples of importing:

1. Example with solo part.

Adopted file: "Leopold Mozart Concerto TB._Archi_Cembalo - I tempo"

Original file: http://www.music4vip.org/tests

1) How to import MusicXML files:

a) After pressing the upload button a dialogue box appears called Edit Part, within which you have to fill some fields for proper conversion. In particular:

1. **Braille Name**, that is the Braille combination representing the musical instrument. Here you need to use Braille;

2. **File**, is the name attributed to the musical instrument. Here we use the alphanumeric keypad to write normally.

3. **Transposition**, that assigns the correct key to transposing instruments;

4. **Direction of intervals**, which allows users to choose whether they want chords to be read from top to bottom or vice versa. This feature is required especially for the left hand of keyboard instruments;

5. **Default clef**, with a drop down menu where you can choose the clef to be inserted into staves for each instrument.

Note: You can choose to open the file without having to go through all of the options described above. In this case the programme contains default values to open the score anyway. If the user does not want to make choices, he can simply press OK after selecting the desired file.

2) Analysis, consideration and remarks on the imported files.

First of all we must say that in working with the above mentioned score (Concerto for Trumpet, Strings and Harpsichord by Leopold Mozart) it is possible to access all functions of the program. This score looks like this:

1. the first line contains part of the title;
2. The second line contains the name of the author, and the date of birth and death;
3. The third and fourth line are a continuation of the title;
4. In the fifth line there is an "I" preceded by capital letter prefix (Braille dots 46) which means first tempo of the composition;
5. In the sixth line the author's name and the date of birth and death appears again
6. In the seventh line there is the name of the reviewer.
7. The eighth line contains in order: the name of the instrument, then key signature, tempo indication and then the music itself, in this case the part of Trumpet in C.

8. In subsequent lines we find music of other instruments, preceded by the name of the instrument, the key signature, time signature and clef.

3. Remarks for the above mentioned score imported from MusicXML to Finale.

1. Metronome mark is missing. Tempo indications, the key signature and time signature are written in the first row of the music instrument, while they should be placed in a dedicated line, before the musical text. Among other things, the sequence of these directions appear in a particular order, namely: part indication, key signature and tempo, clef, dynamic. There may also be a different order as follows: part indication, time signature, metronome, key signature and clef. However this issue deserves further investigation, in order to deal with some differences, because in the case of transposing instruments the key signature must be indicated for each instrument.
2. Consecutive sixteenths and consecutive 32nd notes are scored individually and this slows down writing and consequently reading (this is not a mistake, however, it is just that there is an easier way to write and read this. Perhaps these solutions would have required further work for programmers).
3. The same intervals repeated consecutively, while the Manual recommends the use of contracted writing, in order to speed reading (again this is not an error).
4. The programme always uses long slur sign, Braille dots 56/12 (opening) and dots 45/23 (closing) even for short sections. This solution is included in the Manual. It would also be necessary to include the other sign for binding expression, that is dots 14 (short slur). The authors recommend the adoption of the latter solution, namely: Braille dots 14 (short slur), Braille dots 14/14 (beginning of long slur); 5. Paging appears rather free in the sense that the lines are of variable length and sometimes exceed the compatibility of the normal size of the Braille sheet.

Note: all previous remarks are common to all analysed scores containing similar situations.

5) First options of the program

A) Layout

In order to facilitate reading using a Braille display, the first operation to be carried out is to select an appropriate layout for the Braille score.

Both with BME2 and with BMR, from the tools menu, you can choose whether to present the Braille score **section by section** or **bar over bar**, which are two modalities in use in almost every country, and which correspond to specific needs of the musician, for better reading. In both cases a first dialog box appears that asks if you want to save, and the user is presented the usual dialogue box for file saving. If you choose the bar over bar option, the program presents different options, which include: *Characters per line,* you can decide the length of the line; *spaces before the name of the part, spaces after the name of the part,* whose meaning needs no explanation.

If you choose *section by section* the program presents a wider range of options:

1. *Characters per line,* as explained above;
2. *Number of measures for each section,* meaning a predetermined number of measures per system;
3. *Spaces before the name of the part,* and *spaces after the name of the part,* as already mentioned above;
4. *Add system numbers;* in case this parameter is not active, the program assigns a sequential number to each system.
5. *Number of blank spaces after the system numbers.*

Here immediately arises a very relevant remark: when the prefix for bar division at end of line is inserted, very often the division is random, that is the program does not comply with manual's rules, which indicate that the division of the bar must never split notes belonging to the same movement. We realize that this rule requires much work for programmers, and sometimes it requires human

intervention by expert musician. Perhaps the solution could be to leave to the musician the possibility to separate the beats manually.

Furthermore, it must be remarked here that, even if it is a good solution to automatically number Braille pages, we recommend to track page numbering also on the screen. Likewise numbering of staves could be a good solution in order to facilitate navigation and orientation through the score. Finally, bar numbering should be automatic and it should follow the numbering of the original score.

B) MIDI execution

After you have edited the score according to your convenience, and having verified its contents, the next step should be the real execution of the piece of music (MIDI). The "play" menu is responsible for this objective.

In this menu, as described in another part of this document, there are four options:

- *Whole score (* shortcut: Ctrl +*B);*
- *current bar of current part (* shortcut: b)
- *Current bar (all parts)* (shortcut: Shift+ *B*);
- *Select MIDI Instruments* (shortcut: Ctrl +*I).*

By selecting the "score" option in the play menu, you will see a dialog box called *MIDI sounds*, which contains some options:

1. *Starting measure* number (default = 1) editable; to [measure number] editable;
2. *Tempo (quarter)*, meaning the speed (pulse) of the playback. Unfortunately, it is not possible to change the values, which are "blacked out" and are fixed at a tempo of Quarter note (or crotchet)=120, thus setting the pulse of the performance to this value (another way to change this will be explained in the following);

3. Four options with check boxes: *1) Use Metronome, 2) play Expressions, 3) play repeats, 4) play changes of tempo;*
4. *Instruments,* which, if active, offers the possibility to choose different instruments / muting for different parts..
5. *Close,* that allows you to close the dialog box;
6. *Play,* starts the playback and, at the same time, makes the *Pause and Stop* buttons operable.

The last item on the play menu, *select MIDI Instruments,* using a dialog box, allows you to choose which instruments you want playing.

6) Reflections on MIDI Functions

The MIDI implementations proved functional and interesting. The program complies with the dynamic information in the score. This could be stored using the standard MIDI range from 0 to 127 instead of 50 to 200. The option to customise the tempo at the discretion of the user is excellent.

Tempo: as for the dynamics so for the tempo indications, the program changes the speed of performance following the tempo indications of the user. A very useful feature is the function "MIDI parameters" a menu that allows you to customise both the tempo and the dynamic. In the play menu / whole score option, (ctrl+b) it is not possible to modify tempo indications, which has proved to be very useful, as in the stage of importation the metronome mark is not recognised and the tempo defaults to 120 quarter notes (crotchets) per minute. Strategies capable of modifying tempo are not so easy, especially for less expert users. The restoration of this feature would be particularly useful in cases where the user needs to listen to the piece played at an appropriate tempo in order to get an idea of the piece.

It would be great if the software could perform at least the most common ornaments (Trills, upper and lower mordents, and perhaps even turns). Currently this is limited to acciaccaturas and appoggiaturas.

Concerning the problem of tempo with fixed values to 120, it is possible to change the speed of playback by selecting MIDI parameters from the Insert menu. This item, that is *MIDI parameters*, however, you can choose only if there is a tempo indication. It is not clear how the tempo of the playback can be changed if there is no metronome value.

7) Printing the document

The next step for the user of the software BME2 and BMR is probably that you can print in Braille the score you have just loaded, explored and listened to. Of course, as already pointed out, the software includes this possibility.

With reference to what happens in all applications, the File menu contains the item *Print*, followed by *Page Settings*. This item however, appears also as soon as the *Print* option is activated. After selecting *Print* a dialog box appears, which is the same as the one appearing when you choose page settings, where you can choose between different options: *1) Without page break, 2) lines per page, 3) Translation Table.* By clicking the *Browse* button next to *Translation Table* you can browse through a list of existing conversion tables compatible with the available Braille printer. After you have determined your preferences and you have clicked OK another dialog box appears with typical possibilities for the printing of the score, namely: *Select Printer, to print all the pages, number of copies, etc.*

8) Other possibilities of intervention on the score

In addition to some of the features described above there are some important possibilities to edit the score, introducing amendments, if any, whether necessary or not.

The most laborious task has proved to be adjustment and refinement of the first part of the score, containing the title, the author and the reviewer.

With great patience and strategic inventions it has been possible to align those descriptions; resorting to cuts, glue etc.

It needs to be easier to modify these headings.

In case of need, it is allowed to edit the line to the tempo indication, the metronome, the key signature, time signature, if desired, by suppressing them from musical line of trumpet, but, for the latter operations, it is mandatory to select in text and then choose the cut .

It is worth mentioning another problem: the *Metronome entry*, from the *Insert menu* , does not permit the enrichment of specific indications, by placing the tempo indication in parentheses or with other symbols, such as "c." for Circa, etc.

It is possible to edit notes, and introduce changes, adding or removing separate symbols.

Loading of the individual parts of the different instruments occurs without problems.

2. EXAMPLE SCORE for ORCHESTRA

Johann Sebastian Bach:

Suite for Orchestra BWV 1068

Original file: http://www.music4vip.org/tests

The score was opened, without any problems, by following the above procedure.

Even here, with the exception of the points 2 and 5, because the composition is in 4/4 and there are no slurs, similar issues to the ones described above emerged.

In order to make it compatible with graphic requirements and the need for MIDI performance, it has been necessary to make some changes:

- title and author were positioned on different rows
- the title "Overture", that was placed after the time signature, was moved and the key on a line under the author;
- A metronome indication was added at the beginning (quarter note=50) to give an appropriate tempo to the playback;
- Changed metronome at the beginning of the fugato (half note=50);
- Corrected the labels of the instruments in the score (the timpani part was labelled as a trumpet) and assigning of the respective timbres;
- The recovery of the Ouverture, despite having introduced a tempo indication ("adagio") with the corresponding metronome mark, continues with the fugato tempo;
- Adding the first tempo indication (in Braille dots 3456-2) that the import process has not recognised:

3. EXAMPLE SCORE OF THE ORCHESTRA WITH CHORUS

Johann Sebastian Bach:

Cantata BWV 4 - II Choir

Original file: http://www.music4vip.org/tests

The score was opened, without any problems by following the above procedure.

Even here, with the exception of the points 2 and 5, because the composition is in 4/4 and there are no slurs, similar issues to the ones described above emerged.

Also, a very important limitation, the text of the vocal part is not always imported and there is a difficulty in understanding the part of the content containing the G key with the number eight below (see remark in corresponding part of this document).

4. PIANO COMPOSITION

Ettore Pozzoli: Study no. 25 - Fragment (Studies in fast motion)

Original file: http://www.music4vip.org/tests

The score was opened, without any problems by following the above procedure.

Even here, with the exception of point 2 (there are no bar rests), similar issues to the ones described above emerged.

In addition, the following points are worth making:

1. Double consecutive notes are represented in long form, without the abbreviation sign.
2. Metronome indication is not necessary.

3. Incorrect division of bar with the prefix for the splitting of the end of the line;
4. Fourths on consecutive notes marked one by one.
5. Consecutive staccato signs marked individually, there is no abbreviation;
6. Short expressive slurs written with system "the French manner". It is too heavy.

5. COMPOSITION FOR ORGAN

Johann Sebastian Bach: Prelude BWV 552

Original file: http://www.music4vip.org/tests

Original file: http://www.music4vip.org/tests

All the above comments also apply to this score.

Various other examples of scores for various instruments are attached to this document. Some are in double format: MusicXML and BMML. Others are also in the format MUS, produced by Finale.

6. VARIOUS TESTS

Specific examples

Original file: http://www.music4vip.org/tests

- **Figures, rests, accidentals**

  The program recognises notes, even with one, two and three dots, pauses, simple accidentals and double accidentals, except for the interpretation of 64th notes (hemidemisemiquavers), which, in the playback, at times, are considered as a Bar containing four Beats. The program does not insert a prefix of value, in this case braille dots: 6 /126/2. Divides beats at the end of line.

1. **Clefs:**

   The program recognises all clefs, except for the clef for percussion, for which there is not yet a symbol in Braille.

1. **Key and Time signature:**

   Writes time signature before the clef, and tempo indication after the clef, all in the first line, after the part definition. Usually the order is as follows: tempo, metronome, key signature, time signature. All these indications should appear in a dedicated line, before the music itself.

   In the case of changes of key signature, the program does not write deletion of old accidentals, as indicated in the International Manual of Braille Music notation. In this file we observe also missing translation of metronome marks.

   Irregular groupings and arpeggiato.

Irregular groupings are correctly recognised, but arpeggiato is not recognised.

- **Fingering:**

  Does not recognise fingering when importing a file, as stated in updated user guide.

  Transcribes correctly fingerings in export, including those for bowed instruments.

- **Slurs**

  Slurs are always represented with signs 56-12 (opening) and 45-23 (closure), even between two notes - a little excessive. You should activate the slurs using dots 14, also because having long slurs interspersed with other slurs creates confusion;

  Expressive slurs in polyphony in the same line, in MusicXML export, are ignored if they appear in the second part, while they are imported correctly for both parts, by adopting the French sign.

- **Slurs and chords**

  Correctly importing of slurs but not the chord slurs, which are translated incorrectly. A continuous sequence of identical chords are marked individually, without the technique of grouping.

  Recognises the abbreviation in export module.

- **Octaves:**

  Marks the intervals of the octave as if they were unison signature, i.e.: by placing the sign of the eighth before the symbol of the eighth. In cases where the interval of the octave is accompanied by other intervals, the problem does not exist.

- **Pedal and organ registers:**

  Organ registers are imported correctly. Organ pedalling is ignored.

  In addition to this file:

1. It does not recognise the precautionary accidentals in parentheses; the software always them writes as normal accidentals;
2. As already mentioned above, we do not understand why the octave interval is written with the octave sign before the sign. It always happens, if, in addition to the interval of an octave there are no other intervals on the same note;
3. The registers in organ pieces are written and imported successfully;
4. Does not recognise the musical Comma ((short breath - see stop 4);

- **Percussion**

  If you use the clef specified the software does not recognise the musical text. Yet there is no clef for percussion in Braille.

  Does recognise percussion if coming from writing on normal staff.

- **Signs of expression:**

  Satisfactory.

- **Notes Biscrome Semibiscrome**

  In the conversion from MusicXML groups of notes, demisemiquavers (32nd notes) and hemidemisemiquavers (64th notes) are not grouped, with negative consequences on reading. IT IS confirmed the incorrect splitting of bars for the sign of the head line. The tempo indication and the time signature are placed inside the line, while ordinarily they should be placed in a dedicated line, before the line containing the music itself.

- **Bar lines:**

Imports and exports three types of bar lines: dotted double, single and double final bar line;

- **Unison:**
  Recognises the sign as a second voice. IT IS confirmed the not writing of the Metronome. In export correctly interprets the signature.

- **Arpeggio slurs :**
  Imports arpeggio slurs marking the little notes as short appoggiaturas but there is a limitation that the line through the note stem cannot be represented.
  Does not export the arpeggio slur.

- **Repeats:**
  Does not recognise repeat in importing, but only in exporting procedure.

- **Expressive slur going from one part / voice to another.**
  The software translates it as normal slurs, does not write the special sign for such situations.

- **Expressive slur beginning and ending on the same note:**
  Recognized but translated according to French manner, which slows down reading. Recommended simpler translation according to Manual.

- **Lyrics:**

  BME will not import lyrics but it will export them. The lyrics, however, must be recorded in a new way, conceived by BME2, which considers the situation starting from the text, rather than starting from the music, as it is traditionally.

  Lyrics, however, should use appropriate signs for lyrics (dots 56/23 for start lyrics), and dots 6/3 for start of music. Disposition can be either music and lyrics, or lyrics and music on different lines. In Italy we write first lyrics and then music, as in normal notation (notes underneath words.

- **Bows & Positions:**

  Recognises the positions only while exporting.

- **Tremoloes:**

  Does not recognise tremolo symbols either in importing or in exporting. This stems from a limitation in MusicXML. In fact, there is the same problem for MIDI execution starting from an MusicXML file.

- **Slurs between parts and different staves**

  You cannot export this option. IT IS very complicated to make it effective even using common music notation.

- **Ornaments:**

  Recognises all common ornaments. Does not recognise ornaments with accidentals above the note, but this is a current limit of the MusicXML format;

- **Pedal in piano scores:**

  Does not recognise the piano Pedal even when exporting.

VARIOUS TESTS FOLLOWING
THE INTERNATIONAL MANUAL
TRANSCRIPTION OF BRAILLE MUSIC

1. All the musical notes are correctly translated both in the importing and in the exporting module.
2. **Short values in regular rhythmic Groups :** ignores the convention, and writes all the figures in extended form;
3. **Chords:** writes correctly the interval symbols for the chord, with the exception of the octave, which is represented as if it were a unison, placing the octave sign before the octave interval sign. This happens if there are no other concurrent intervals;
4. **Irregular Groups:** recognises the irregular groups, but it considers them as single instances, even when there is a long sequence, and does not use contracted notation, as recommended in the Manual.
5. **In-accord situation.** Recognises full measure in-accord, but does not recognise partial in-accord, which is translated always as full measure in-accord.
6. **Expressive slurs which finish and begin on the same note:** the software recognises both for imports and exports;
7. **Expressive slurs** in polyphony in the same line are successfully imported in most parts, using the French modality.
8. **Expressive slurs:** sometimes the software puts the end slur after the fermata sign;
9. **All kinds of slurs** binding different parts / staves are not correctly translated.
10. **Dotted slurs** are translated as normal slurs.

11. **When a dotted slur** is encountered (dots 5/123/14) notes are suppressed (see file with dotted slurs)
    all file of test are here: http://www.music4vip.org/tests
12. **The whole issue concerning** expressive slurs should be deeply revised.
13. **Slurs for chords** are to be deeply refined. Chord slurs are correctly exported, but importing is incorrect.
14. **Consecutive chords are not correctly imported.** In particular the program does not adopt contracted representation as recommended in the Manual;
15. **Clefs are correctly interpreted both in export and in import modules,** except for G clef with 8 underneath; in particular, the exportation module does not use the correct octave.
16. **Slurs in arpeggio:** the program writes and plays correctly, but does not export correctly.
17. **Ties between different parts / staves.** Does not export and import correctly.
18. **Repeats:** correctly exported, incorrectly imported.
19. **Tremolo:** is written and executed, but is not exported (see remark in another part of the document);
20. **Fingering:** is exported correctly, but as stated in warnings included in the manual of the software, it is not imported.
21. **Preparation for exporting.** This operation seems very difficult to be carried out without external help, starting from Braille input. Control it from Braille. Further intervention in normal notation is necessary to tidy up the appearance of the score and adjust formatting, before saving the result;
22. **Fingering for bow instruments.** Correctly exported, but incorrectly imported.
23. **Fingering extensions in bow instruments.** Not possible to import.

24. **Repetitions**: import and performs repetitions, but not the other conventional signs: D. C. , CODA, $, etc. ;
25. **Fingering for plectrum instruments**: consists of letters or dots. In braille it is always translated with letters. You cannot import this into BME2 from MusicXML;
26. **Signs of expression**: the short signs are entered without spaces before or after the sign; dot 3 is never inserted, as it should be. In any case, blank spaces should never be inserted.
27. **Long indications containing text** should be separated with a blank space and should be preceded and followed by word sign. Use dot 5 if the bar cannot fit in the Braille line.
28. **Dynamic signs**: there are many such signs: including different kinds of accents, staccato, etc. Crescendo & Diminuendo on the same note, (see the file "*signs of expression*");
29. **Sometimes the programme writes the prefix of end of the text**, even where it is not necessary, in case of a single word.
30. **Extensions of dynamic signs**, because text importing is not allowed by the software, are not possible;
31. **Does not recognise** the dotted slur;
32. **Rests of a whole bar** are always represented with symbols corresponding to the length of the bar itself, whereas the Manual states that a rest of one bar should always be represented with dots 134.
33. Does not execute ornaments except for short appoggiaturas and appoggiaturas.

OTHER COMMENTS
FOLLOWING
THE INTERNATIONAL MANUAL
TRANSCRIPTION OF BRAILLE MUSIC

1. Chords in short form. They are not represented, because of lack of text exporting function.
2. Figured bass. Analysis omitted because it was not planned.
3. Modern music - not planned
4. Note crossing staves. Represents it only in one stave.
5. Vocal music. Analysis omitted because lyric has not been implemented.
6. **Bow and string instruments -** Does not import the position marks (see the file ARCS). Exporting is correct. The harmonic sign is not recognised, but this is a limit of MusicXML; many of the other specific signs are difficult to interpret from the MusicXML, because of some ambiguities in their meaning from a graphic point of view. For this reason this limit cannot be considered a limit of BME2.
7. **WIND INSTRUMENTS -** signs representing short breath are not imported;
8. P**ERCUSSION INSTRUMENTS**: there are no problems of interpretation if notes are written on a normal staff. Does not recognise notes, if placed on a single line. Does not recognise the explanatory text, known limit; recognises scores for percussion provided it comes from a complete staff, although with a specific clef. There is no indication for the percussion clef, for which, at the moment there is no Braille symbol;
9. **ACCORDION:** is not taken into consideration for the import because various symbols indicating are derived from other contexts, for example: various positions of the arcs for the rows of buttons or fingerings, transposed from the Piano;

10. **SCORES:** valid interpretation of the scores for the musical notes, considering the remarks already described.

FURTHER INDICATIONS

(Recurrence)

1. Missing "exit" in the file menu.
2. In the import menu, it would be useful to implement also the entry " *Import MIDI"*. Considering the development of the MusicXML standard this item is not indispensable, but it is certainly useful, because it is included in all common music software of this kind.
3. In MusicXML export, it would be a good idea to include a "font" option.
4. In the insert menu, under the heading *"MIDI parameters for the entire score"*, in dialog box, the signs are in English. It is unclear whether this is a choice or an oversight.
5. The play Menu / *whole score* opens a dialog box that includes a heading concerning the choice of the performance speed; the values are fixed at 120, causing the playback to be at this speed, if tempo is missing. We recommend the implementation of the possibility to select a different performance speed without having to insert tempo indications (observation already described above);
6. Title is Not correctly paginated, especially when it exceeds the desired characters per line. If the original title exceeds the number of characters the program does not produce a correct layout.
7. Since we are dealing with importing file from a print text, it would be very appropriate to maintain automatically the same number of beats per system as in the original text;

8. It is also important to maintain the numbering of the right in progressive order starting from number 1, with reference to the original paging, including possibly the end-of-page symbol, Braille dots: 5/25;
9. It would be useful also to provide the page number in Braille, with reference to the setting of the desired page, selectable from the *"File"* menu. This would encourage easier communication between the blind user and his / her sighted peer;
10. The Undo feature of the Edit menu would be appropriate if, as for example in Finale, it would undo not only the last operation, but also the last file saving operation.
11. In the *"Insert"* menu, under the heading *"Properties"*, in the dialog box there are interesting options, but they are quite difficult to control, considering the fact that they refer to the layout of the print score.
12. In playback (Play menu), it is not possible to choose performance speed (see above).
13. Ornaments are not executed, except for trills and appoggiaturas;
14. Bar splitting is not correct.
15. Piano pedal is not imported;
16. G clef with 8 under the clef. - The software transposes the part. International Manual recommends maintaining the same octave as in the original text.
17. Notes across the staves are imported as if they were written on a single staff;
18. Dynamics, especially the crescendo and diminuendo hairpins, should be merged into the music, without spaces, even if at the beginning of the measure;
19. In the file menu option *'close'*is missing, to remove a document in memory, for example by ignoring the changes and reopen it. One is forced to exit the software or use the taskbar to close individual documents;

20. Notes in small print, if they are grouped, are always interpreted as if they were appoggiaturas. This however is a limit in the translation in MusicXML;
21. In paging procedure, if the title exceeds the number of characters per line, the programme ignores the selected line length.
22. At the beginning of the piece the dynamic indication, key signature and time signature are inserted in the first line and not in a previous line at the beginning of the musical text, among other things, by placing the key signature and the time signature before the clef;
23. Irregular rhythmic groups are read correctly by MusicXML only if structured in a certain way. This has of course also effect in the import in Braille.

SUMMARY SYNTHESIS

SOME OF THE CHALLENGES FOR THE SOFTWARE

(Current version)

1. Does not use the value distinction prefix where necessary;
2. Sometimes the bar interruption sign is used in an improper manner, especially when it is necessary to divide the measure because there is an end of line;
3. Key signature is correct, but when there is a change of key, the programme does not indicate the accidentals to be deleted.
4. The grouping of semiquavers (16th notes) or smaller notes is always ignored;
5. Consecutive irregular groupings are always not correctly translated, that is to say, rules for such situations have not been implemented;

Rules for contracted notation of sequences of irregular groupings are ignored. : it should double the sign for the first group, which has value for all the single notes

that follow, until the new indication. In the export from Braille to MusicXML, the interpretation is correct.

6. The chords, intervals, are written correctly with the exception of the interval of an octave, which is treated as if it were a unison.
7. Cluster chords are treated as single chords, whereas the Manual has specific rules for this kind of situation;
8. Does not use partial in-accord, even when it is necessary.
9. Ignores the symbols of passage notes in interval and passage notes in situations with two or more intervals;
10. Does not apply the unison signs, and uses in-accord signs instead;
11. uses only the French slur sign, ignoring all other signs for this situation;
12. Ignores the dotted slurs;
13. Ignores more complex slurs;
14. Ignores slurs in chords;
15. Ignores slurs in arpeggios;
16. Ignores the various kinds of ties of special value, for example: ties between different parts, different staves, ties in in-accord passages, etc. However such situations are difficult to manage even with common music notation, if you want to have effect in the MIDI performance;
17. Does not recognise repeats, although it exports them correctly;
18. Does not handle the alternating, but this is a complication also with common notation.
19. Does not import fingering. This is recognised and reported in the user manual. Signs are exported correctly, even for bow instruments;
20. Does not recognise complex repetition signs, while simple repetitions are interpreted correctly;
21. Does not apply the typical signs of repetition Braille for sections, or other type, specific for reducing the length of the scores;
22. Recognises expression signs, but ignores the signs of extension for this symbology;

23. Does not apply the abbreviations in the case of consecutive signs (see above);
24. Recognises the more common ornaments, but it ignores any accidentals above or below the note (a limitation of MusicXML);
25. Ignores the sign of parenthesis for musical symbols;
26. Does not interpret figured bass, as a consequence of not importing text;
27. It would be useful to implement the finish mark page referred to the original text;
28. In the metronome window it is not possible to add text. This can be done only using the text window;
29. Tempo, metronome, key signature and time signature should all be put in a dedicated line, before the music itself. For scores which include transposing instruments, key signatures should be written for each instrument;
30. Metronome indications are not imported;
31. Passages written on two staves are treated as if they were written in one and the same stave;
32. Piano pedal is ignored;
33. Organ pedalling is not imported; common music notation uses symbols of different types, so this limitation is justified;
34. Lyrics are not imported;
35. Fingering and position in bow instruments are not recognised in importing module;
36. For plucked instruments see above;
37. Does not recognise half breath;
38. Does not recognise clef for percussion instruments;
39. Does not recognise additional signs for accordeon;

Note - Signs for music theory and signs for modern music have not been considered in this analysis.

CONCLUSIONS

Taking into account the findings we have dealt with in this document, here are some suggestions about priorities which should be considered for immediate refinements and for future developments of BME2, in order to improve its usability and its effectiveness.

As regards the importing process from MusicXML into BMML format, BME2 proves to be effective for the transcription of notes and rests. Also with regard to expression signs and ornaments, the software works fairly well.

Keeping in mind that we are dealing with a relatively young piece of software, which is currently only in its second version, we believe that it is necessary to review some of its features which have already been implemented, and we believe that some refinements are necessary.

First of all the developers should make every effort to implement the correct interpretation of lyrics, for vocal music, which at present is totally absent.

With regards to the interpretation of notes, it is highly necessary to implement rules concerning contracted Braille notation, particularly for consecutive semiquavers (16th notes) and smaller values, and for consecutive irregular groupings.

Bar splitting should be corrected, especially with the end of line situation.

Chord groupings both in regular and irregular groupings need very urgently to be implemented.

Analogously, consecutive staccato notes and the like.

A very relevant issue concerns ties and slurs, whose correct interpretation is of high importance. The present situation, based only on the French slur, makes reading more onerous.

Metronome indications should be urgently implemented.

Top of the page texts need to be refined, by implementing appropriate tools for their best possible disposition on the page.

Tempo, time and key signatures, should be placed according to the rules for good layout of music scores.

The MIDI function has been significantly improved, even if it requires further refinements.

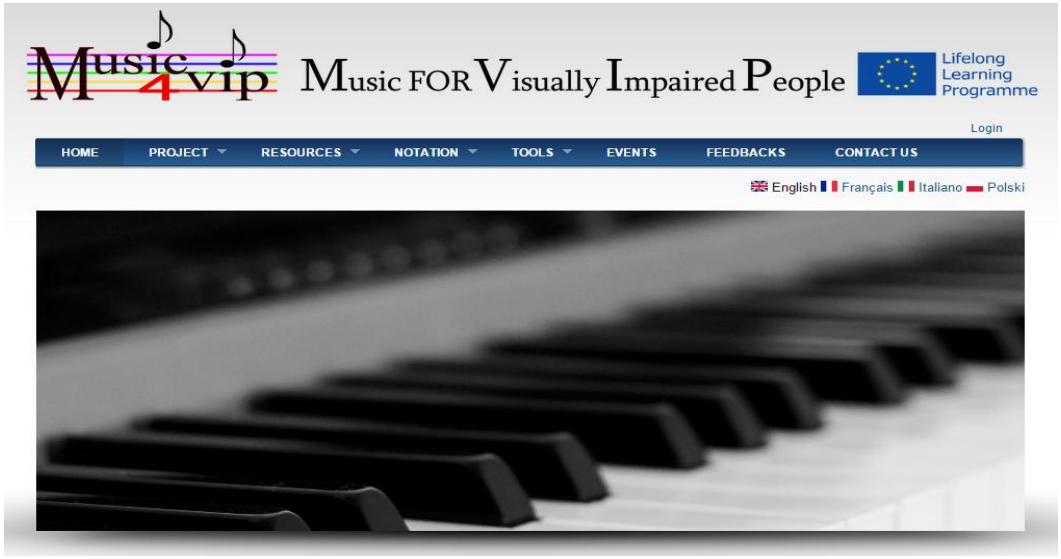
From a general point of view, we could observe that BME2 has higher performances in exporting, rather than in the importing procedure. It must be said however that the importing function is very much in demand by users.

In conclusion we confirm the validity of this piece of software. This software is the most effective among existing tools for blind musicians, who in many occasions admire it, considering the complexity of music notation, and consequently the difficulty to establish effective communication between the blind musician and his / her sighted peer.

We wish to congratulate the authors and the developers, in the sincere hope that suggested updates will be implemented in a reasonable time. The suggested ameliorations will make BME2 very competitive on an international level, because the blind musician will be able to communicate effectively with his / her sighted peers, and because access to music will be based on a more comprehensive strategy, which draws benefits both from Braille as the main way for penetrating music as a language, and from hearing, that is able to offer an immediate overview of the new score.

Padua, Oct the 3rd 2014

6. Evaluation of Accessibility of the Web portal Music4vip.org



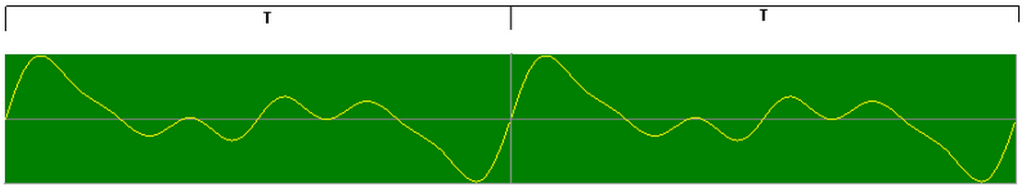
6.1 Introduction

When we talk about the Mus4VIP portal accessibility, we do not mean only the possibility to access the many pages proposed, but also to use the documents (music or drawings) present within. This is not a marginal or secondary aspect but it is fundamental because if you need to access the typical music contents, the web accessibility is not sufficient, but above all you need the included files (music and

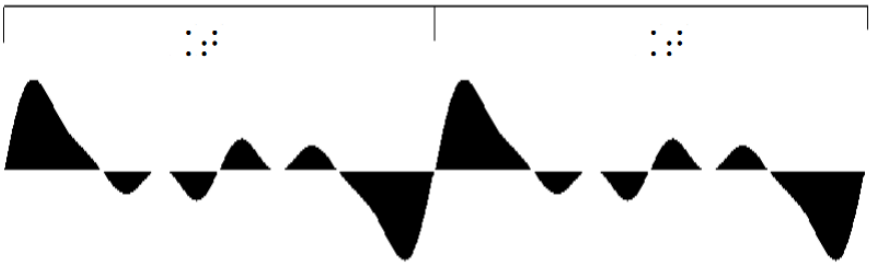
Braille) to be accessible. In order to make these music documents accessible, it is necessary to create specific files. In our case, hundreds of files were created in a BMML format or in MIDI format precisely for making all the contents equally readable. Not only this: in some cases (for example in the acoustics book) specific files were created to be printed with the printers in relief so as to be touched. A sound wave representation for sighted people is simple, you only need a drawing, as in the following image:

PERIODICAL COMPLEX WAVE

Let's now examine more closely a wave called "periodical" because it is repeated over time in constant form. I
while figure 10 represents a sinusoidal wave.



How can you represent the same wave for a blind person? Here, then, the need to realise specific images, expressly designed to be printed with special Braille printers. In this way, the user, can download the file at home, print it and then explore the page in relief.



This kind of operation, that is turning a visual image into a tactile image, is very complex and requires a lot of work because the tactile perception in order to be efficient has to respect dimensional parameters. For this reason, the accessibility of our website included expert designers that created the tactile images, and students and teachers who tested the quality of the images in relief.

6.2 The music4vip.org website

The Mus4VIP site was developed keeping in mind the accessibility issues. All the pages were created using Django.

Django is a free open source web application framework, written in Python, which follows the model–view–controller (MVC) architectural pattern.

It is maintained by the Django Software Foundation (DSF), an independent organization established as non-profit.

The reasons for which Django was chosen, as the development platform, are essentially related to the following specific functionalities.

- Relational Database abstraction to objects.
- Possibility to install functionalities through a plug in.
- Localisation support, including administrative interface translations in many languages.
- Users' management system and their authentication in the web application.
- HTML forms creation and validation system. This was an essential aspect for our activity.

For the accessibility tests, we used three systems:

1) Web Accessibility Evaluation Tool

The first system used a plugin called WAVE (Web Accessibility Evaluation Tool) to Google Chrome.

WAVE is a web accessibility evaluation tool developed by WebAIM.org. It provides visual feedback about the accessibility of your web content by injecting icons and indicators into your page. No automated tool can tell you if your page is accessible, but WAVE facilitates human evaluation and educates about accessibility issues. All analysis is done entirely within the Chrome browser allowing secure valuation of intranet, local, password protected, and other sensitive web pages.

2) via Screen reader Jaws

The second system experienced accessibility through the direct use of typical tools used by blind people such as screen readers, like Jaws and the Braille bar.- Every file present in the site was tested using Jaws version 14 and the Braille bar "BAUM 40 characters". The blind user was invited to access several links, downloading files and reading the contents through the above mentioned tools, that is Braille bar, Jaws and the BMR program for reading music.

3) Sperimental approach

The third system was to directly involve the blind people to understand how to manage the different documents. The accessibility problem is not only related to the page's accessibility but also and especially to how to make all the available documents in the site accessible. The documents such as the theory and acoustics books, the didactic lessons were organised in a way to facilitate the document accessibility. In fact, the documents with music images within (music lines, symbols, like the printing musical fragments) can be all translated in Braille and saved in a BMML format so that the user can download the file and open it, thanks to the BME2 program or BMR. This kind of activity was really challenging considering that every musical fragment has been tested both from a sonic (the MIDI result had to be compliant with the printed document) and a tactile point of view (on the Braille bar, there is a correct correspondence)

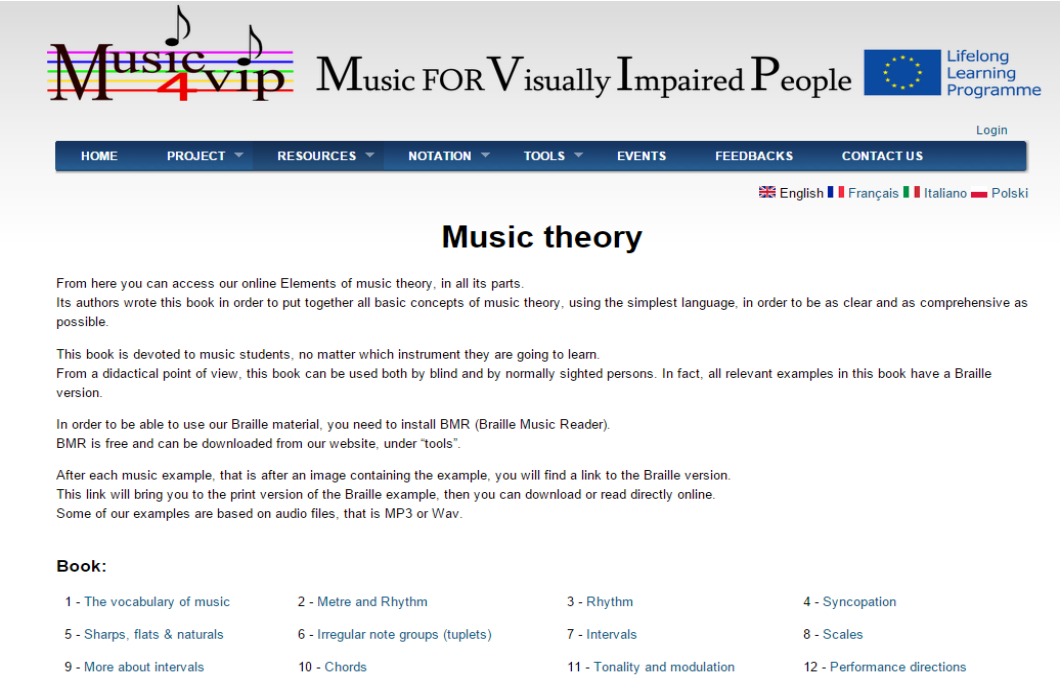
Site accessibility. Analysis with the Wave plug in

The WAVE system produces, for every single page a report identifying any difficulties. All the pages were tested and the result is 0 mistakes. All pages have some "Alerts" and some pages have "Features"; however, these indications do not prejudice the accessibility. These responses are to be considered as a warning referring to possible inconvenient concerning accessibility, which must be verified. Some examples: pdf files, two elements with the same text. However, we have examined all warnings by the system and we have asked some expert blind users to help us.

No remark or request for correction has been received from our blind users.

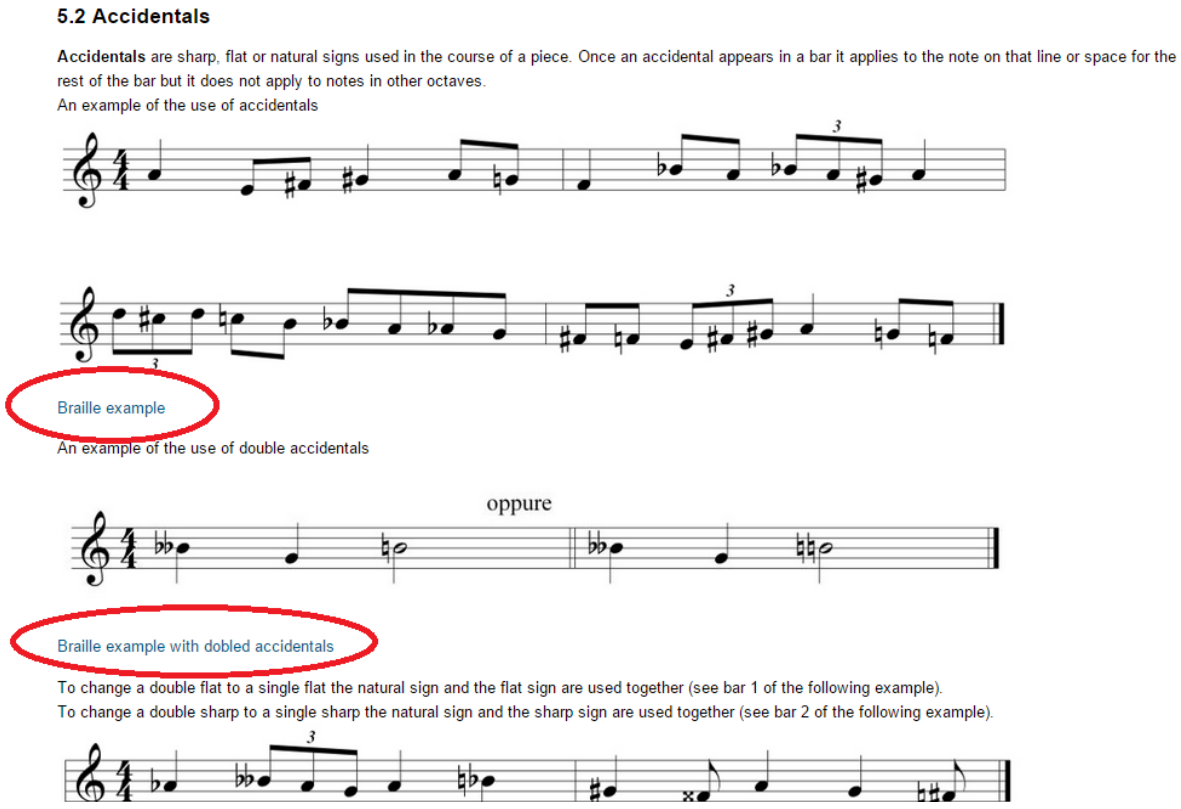
6.3 Portal structure.

The portal includes eight menus each of which leads to several pages, which in turn can include video lessons , real books tools for conversions, software to download etc etc.



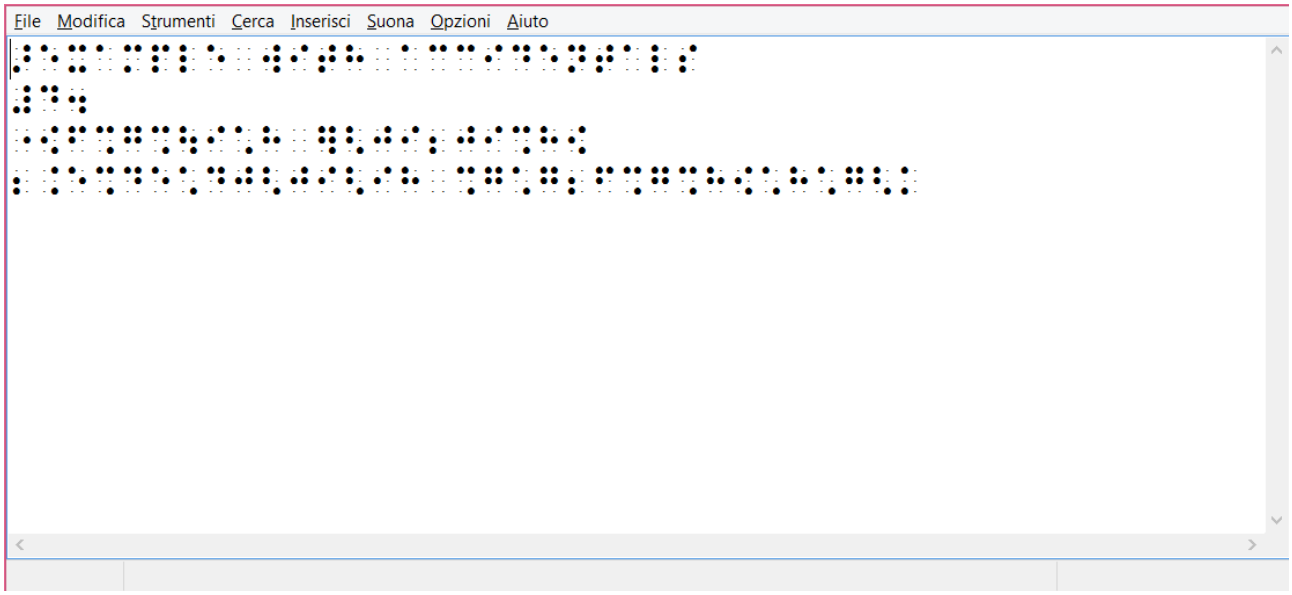
For example, the theory book is divided into chapters.

And through the chapters' headings, it is possible to open the actual pages .

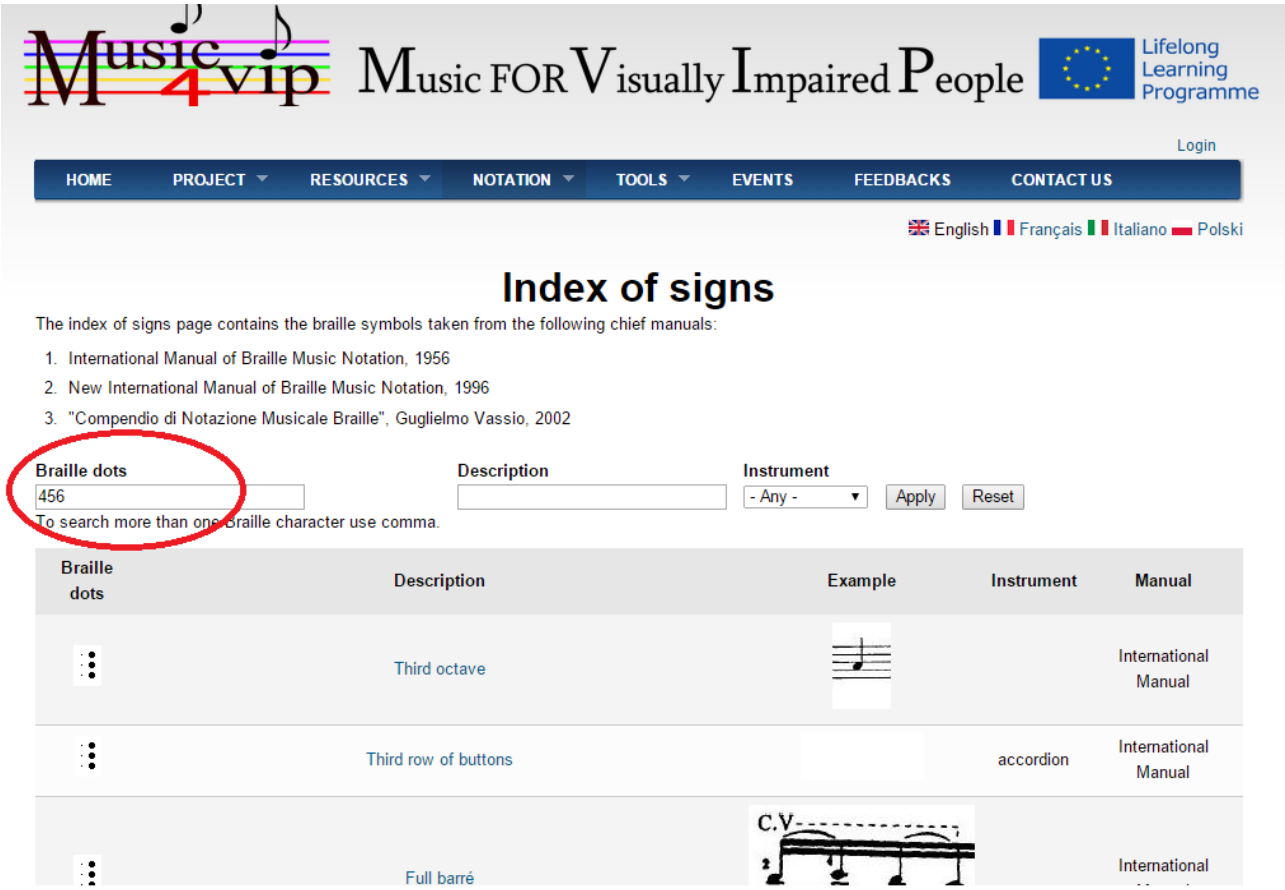


We would like to emphasise that all the printed musical examples were also transcribed in Braille. Therefore, all that is evident in video can be experienced through the sound and the Braille bar. In the figure above, the musical parts were transcribed in Braille. The users, through a click on the Braille example link, has the opportunity to download the file in a BMML format and to explore it with the BMR program.

This is what you see in Braille format



Another example of specific accessibility for blind people is the signs' index.



Through this tool, the user can look for a Braille symbol starting from the dots that compose it. For example, typing the numbers 456 within the Braille dots box, the user can check how many and which are the Braille symbols using this character. This page is, of course, also totally accessible

7. Internal Evaluation activity on the Management Quality

An internal evaluation activity on the management quality was carried out and here you find the statistical results.

The statistics produced were analysed in two different evaluation periods, the first one in March 2014 and the second one in December 2014 using the same questionnaire

The management is composed of 6 persons who are the project partners:

P1	Italy	Irifor di Firenze
P2	Poland	EKMS - Edwin Kowalik Music Society
P3	Italy	Conservatorio Statale di Musica di Padova “Cesare Pollini”
P4	Italy	ARCA progetti Verona
P5	France	UT2J UT2J: Université de Toulouse Jean Jaures Department: IUFM Midi Pyrénées Equipe: SIG-TOBIA, IRIT
P6	UK	NCWNew College Worcester

The answers were:

6 for the first questionnaire, that is everyone and 6 for the second, identical to the first one but at a later time.

Following questionnaire in word format was submitted:

Education and Culture DG
Lifelong Learning Programme

European Project Mus4VIP Nr. 2012- 4250

Demonstration phase

QUESTIONNAIRE ON MANAGEMENT EVALUATION

1. How do you rate the project course carried out so far?

- Excellent
- Good
- Sufficient
- Not sufficient
- Very poor

2. How do you rate the work carried out by the partner?

- Excellent
- Good
- Sufficient
- Not sufficient
- Very poor

3. How do you rate the clearness level of the communication?

- Extremely efficient

- Very efficient
- Quite efficient
- Little efficient
- Not at all efficient

4. How do you rate the partners' efforts to improve their work and internal cooperation?

- Extremely tough
- Very tough
- Sufficient
- Not sufficient
- Very poor

5. How much does this project stimulate you?

- Extremely
- A lot
- Quite
- Little
- Not at all

1. ***How do you rate the response capacity to the users' needs given by the prepared tools?***

- Extremely adequate
- Very adequate
- Quite adequate
- Little adequate

- Totally adequate

7. How do you rate the general level of the project?

- Excellent
- Good
- Sufficient
- Not sufficient
- Very poor

8. How do you rate the capacity to disseminate and publicise the data?

- Extremely efficient
- Very efficient
- Quite efficient
- Little efficient
- Not at all efficient

Education and Culture DG

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

table summarizing collected data:

1. How do you rate the project course carried out so far?	I Questionnaire	II Questionnaire
Excellent	5	6
Good	1	0
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
2. How do you rate the work carried out by the partner?		
Excellent	4	5
Good	1	1
Sufficient	1	0
Not sufficient	0	0
Very poor	0	0
3. How do you rate the clearness level of the communication?		
Extremely efficient	4	6
Very efficient	1	0
Quite efficient	0	0
Little efficient	1	0
Not at all efficient	0	0

4. How do you rate the partners' efforts to improve their work and internal cooperation?		
Extremely tough	3	2
Very tough	2	4
Sufficient	1	0
Not sufficient	0	0
Very poor	0	0
5. How much does this project stimulate you?		
Extremely	4	5
A lot	2	1
Quite	0	0
A little	0	0
Not at all	0	0
6. How do you rate the response capacity to the users' needs given by the prepared tools?		
Extremely adequate	3	3
Very adequate	3	3
Quite adequate	0	2
Little adequate	0	1
Totally inadequate	0	0

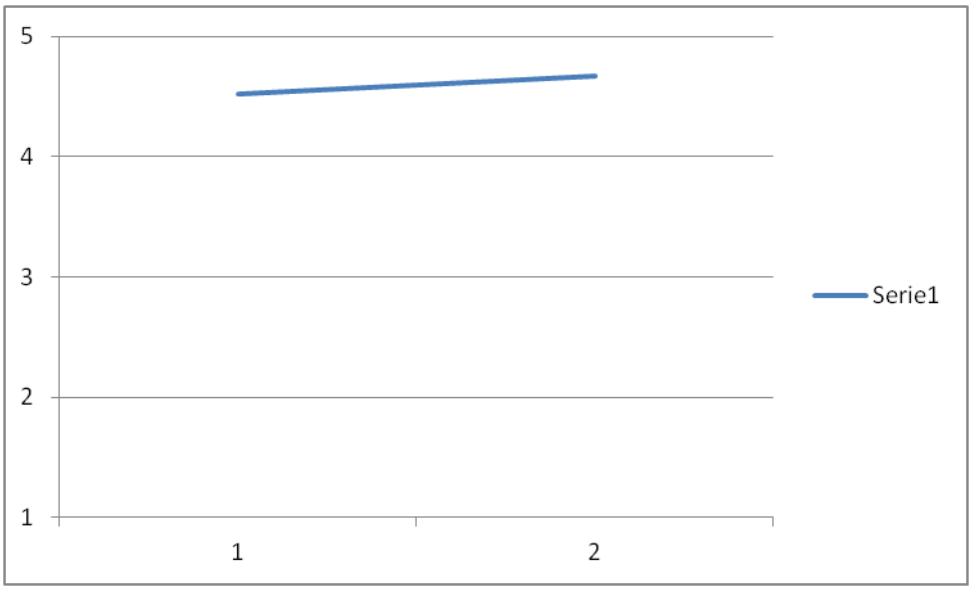
7. How do you rate the general level of the project?		
Excellent	5	6
Good	1	0
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
8. How do you rate the capacity to disseminate and publicise the data?		
Extremely efficient	4	5
Very efficient	0	1
Quite efficient	1	0
Little efficient	1	0
Not at all efficient	0	0

Indicating the answer with a value higher than 5 (for example excellent) and that with a value lower than 1 you got:

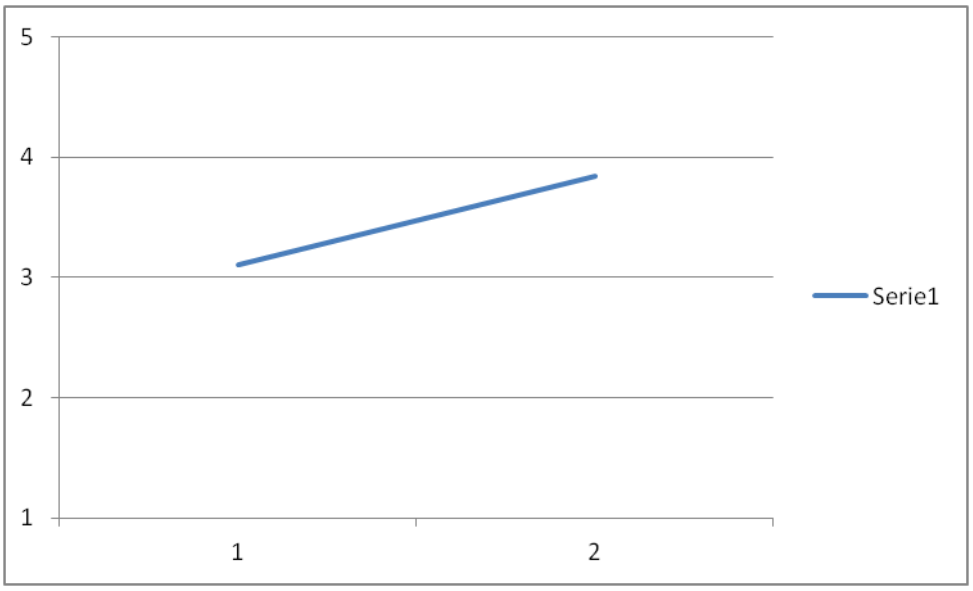
AVERAGE OF ANSWERS: 4,52 (that is a value between good and excellent) for the 1st Questionnaire

4,66 (that is a value between good and excellent) for the 2nd Questionnaire

The second value is higher than the first one



VARIANCE OF THE ANSWERS: 3,1 in the 1st Questionnaire and 3,8 in the second questionnaire



SIGNIFICANCE OF THE DATA (t di Student): The difference between the averages 4,52 and 4,66 is significant.

The differences between the variances 3,1 and 3,8 is significant.

Interpretation of the data:

The management is more satisfied and aware of its role in the second questionnaire that took place later. The data are however high and therefore we can affirm that in this project, the participants countries, through their representatives, are more involved in the project steps, trying to contribute in the dissemination phase as well as in the evaluation one. The higher variance in the second questionnaire tells us that there was less general harmony in the answers.

8. Statistics on Qualities of the partnership meeting

The consortium organized two general meetings during the second work year. In the first one in 2014, the project officer and the EACEA Agency administrative manager were present.

Immediately after each meeting, we asked the participants to evaluate the meetings including pointing out reflections to improve the future quality of the following meetings.

The answers were:

10 at the first meeting that is 90% of the participants

9 at the second meeting that is 100% of the participants.

Here the evaluation questionnaire in Word format, which we used for the two meetings.

First and second meeting:

1. How do you rate the partnership meeting level compared to the others you attended in the past?

- (•) Excellent
- ( ) Good
- ( ) Sufficient
- ( ) Not sufficient
- ( ) Very poor

2. How do you rate the content of the speeches by the several WP coordinators?

- ( ) Excellent
- ( ) Good
- ( ) Sufficient
- ( ) Not sufficient
- ( ) Very poor

3. How do you rate the clearness level of the communication, especially on the next working phases?

- ( ) Extremely efficient
- ( ) Really efficient
- ( ) Quite efficient
- ( ) Ineffective
- ( ) Not at all effective

4. How do you rate the organizers' efforts for the success of the meeting?

- Extremely tough
- Very tough
- Sufficient
- Not sufficient
- Very poor

5. How much of this conference involved you professionally?

- Extremely
- Great
- Quite
- Little
- Not at all

6. How do you rate the response capacity of this meeting to your information needs for the prosecution of the project with reference to the Work Plan?

- Extremely adequate
- Very adequate
- Quite adequate
- Little adequate
- Totally inadequate

7. How do you rate the general level of the participation and collaboration of all the partners?

- Excellent
- Good
- Sufficient
- Not sufficient
- Very poor

8. How do you rate the capacity of the meetings' participants in answering to the other participants questions?

- Extremely efficient
- Very efficient
- Quite efficient
- Little efficient
- Not at all efficient

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Education and Culture DG

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Table summarizing collected data:

1. How do you rate the partnership meeting level compared to the others you attended in the past?	I Meeting	II Meeting
Excellent	8	4
Good	2	5
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
2. How do you rate the content of the speeches by the several WP coordinators?		
Excellent	7	5
Good	3	4
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
3. How do you rate the clearness level of the communication, especially on the next working phases?		
Extremely efficient	6	5
Really efficient	3	4
Quite efficient	1	0
Ineffective	0	0

Not at all effective	0	0
4. How do you rate the organizers' efforts for the success of the meeting?		
Extremely tough	3	2
Very tough	7	7
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
5. How much of this conference involved you professionally?		
Extremely	6	3
Great	4	6
Quite	0	0
Little	0	0
Not at all	0	0
6. How do you rate the response capacity of this meeting to your information needs for the prosecution of the project with reference to the Work Plan?		
Extremely adequate	6	3
Very adequate	4	6
Quite adequate	0	0
Little adequate	0	0
Totally inadequate	0	0

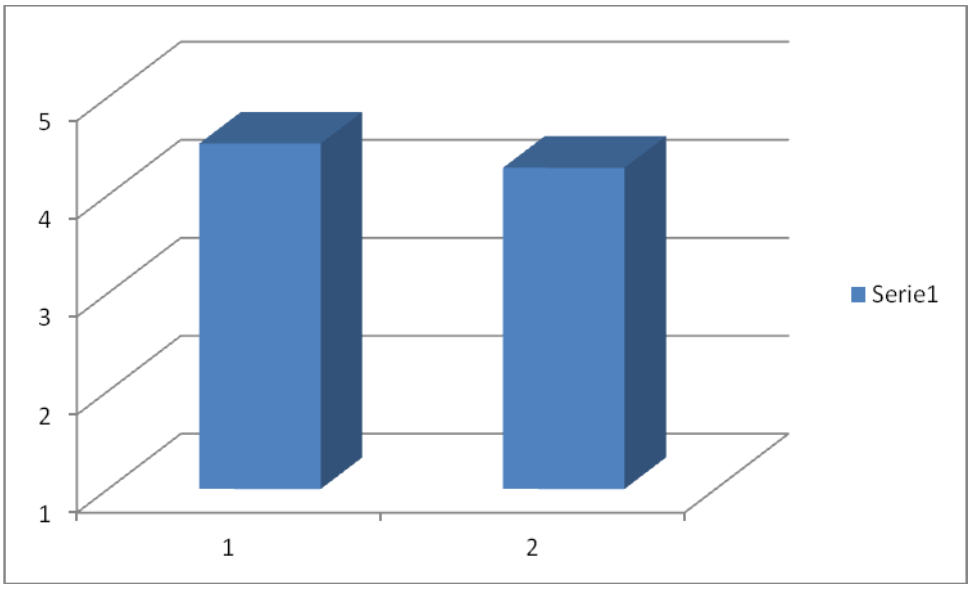
7. How do you rate the general level of the participation and collaboration of all the partners?	I Conference	II Conference
Excellent	7	3
Good	3	6
Sufficient	0	0
Not sufficient	0	0
Very poor	0	0
8. How do you rate the capacity of the meetings' participants in answering to the other participants questions?		
Extremely efficient	7	3
Very efficient	3	5
Quite efficient	0	0
Little efficient	0	0
Not at all efficient	0	0

Indicating the answer with a value higher than 5 (excellent for example) and one with a value less than 1: we obtain following results:

AVERAGE OF THE ANSWERS: 4,5 (that is a value between good and excellent) for the 1st conference

4,3 (that is a value between good and excellent) for the 2nd conference

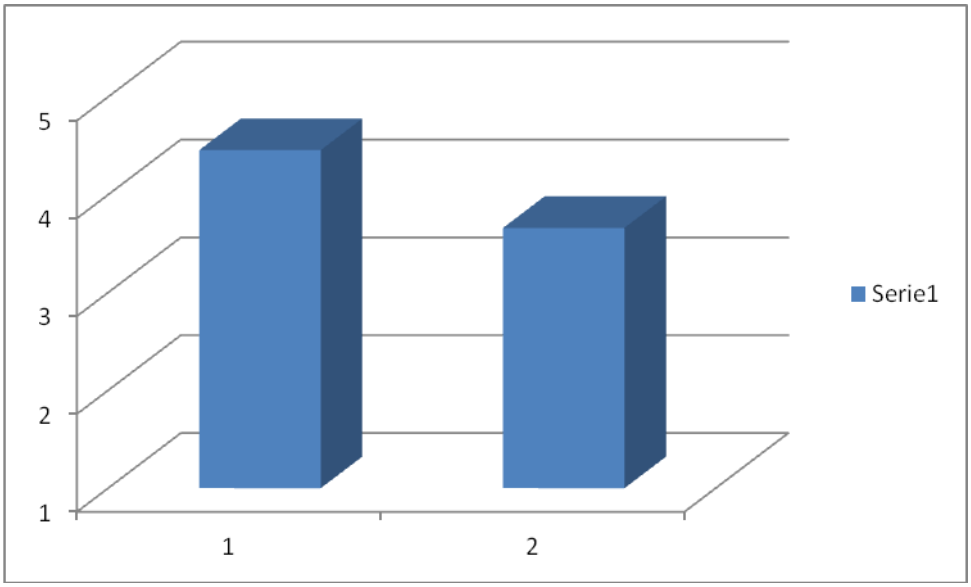
The second value is lower than the first value.



Variance of the answers: 4,45 in the 1st Conference and 3,66 in the 2nd Conference.

Significance of the data (T of Student): the difference between the average 4,5 and 4,3 is not significant.

The difference of the variances 4,45 and 3,66 is significant.



Interpretation of the data:

The meeting quality, the managing, the work carried out and the participation are overall good and excellent.

There is a greater variability in the answers of the 1st Conference compared to the 2nd Conference and this suggests a different distribution of the answers. It is possible to say that the quality of the speeches, the planning work of the total meetings are guaranteed.

9. Concluding evaluation summary

European Project Mus4VIP Nr. 2012- 4250

EVALUATION DEMONSTRATION PHASE

From the analysis of the answers and the adopted methodologies it is possible to affirm that:

The project evaluation is positive because:

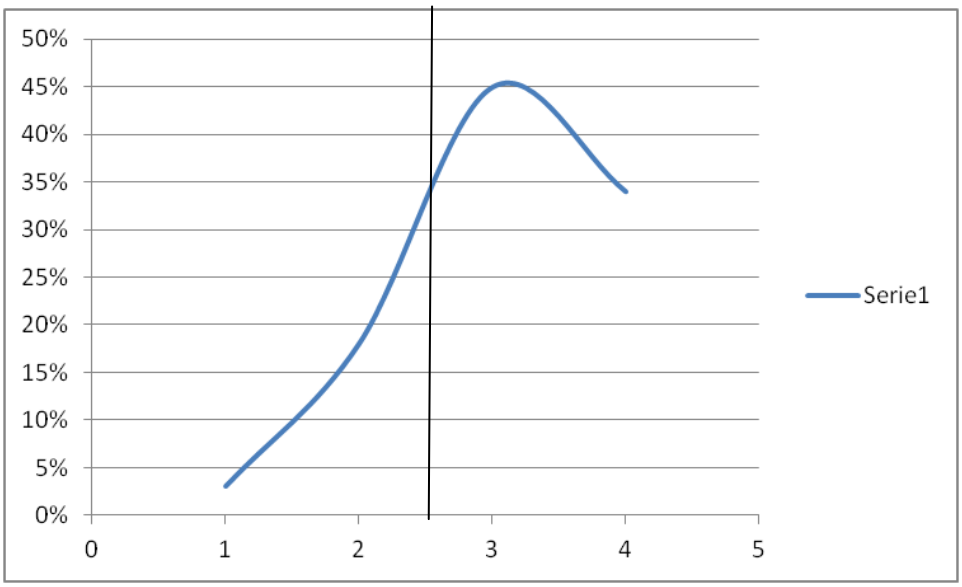
The answers have a general high and varied average, that is not homogeneous answers compared to the low average.

The quantiles which are the distribution of the answers supposing that generally the answers are distributed in a Gaussian distribution, moved to the right that is a good or excellent judgement of the project itself.

Here they are:

1 Insufficient , 2 little, 3 satisfactory, 4 good, 5 very good

QUANTILI	I QUANTILE	II QUANTILE	III QUANTILE	IV QUANTILE
percentages	3%	18%	45%	34%



As is evident in the graph, there is a clear shift to the right which means good and very good judgements that make us proud of our engagement and for the evaluations given by those filling the questionnaires.

Owing to the decay of music studies in Europe and in the world, the numbers of potential testers is much lower than even 20 or 30 years ago. The core idea of our project is based on the work hypothesis that there is growing interest in music studies, but traditional learning tools and teaching methodologies are no longer adequate for present learning styles as well as for present motivations.

In this document we have tried to show that, in order to assess effectiveness of a survey based on sample population, the number of involved individuals is less relevant than the selection criteria of the considered sample.

Secondly, statistical data confirm our provisional results, as described in D4.1.

Thirdly, the scientific survey conducted by Prof. Rizzato and Prof. De Zordo about the import module of BME2 offer a solid and systematic treatment of strong and weak points not only of the above mentioned module, but of the entire BME2 software.

On the basis of the data gathered as well as of the survey conducted by De Zordo et others., Arca progetti has drawn up a work plan for refinements and improvements, which will be dealt with in the exploitation plan (see Deliverable D7.1).

Furthermore, as shown by statistical data, the resources we offered to our interlocutors, in terms of technologies as well as in terms of human help and support, have proved to be effective in the majority of cases.

Finally, it must be noticed here that the sample population belongs to national communities with a very rich cultural background in the specific domain of Braille music. In other words, in all partner countries there is a long and fruitful tradition in the field of music studies, of Braille music production and of good practice, although based on old technologies. This reference framework will be valued in our exploitation plan, in order to draw benefit from good outcomes of traditional strategies, and to revive them using our innovative technologies. We are sure that all our 52 testers will be effective testimonials in the near future and will be live messengers of the new opportunities in the domain of music literacy for blind persons.

10. References

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