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Digital technology and transmission of Intangible Cultural Heritage: the case of Cantu a Tenore

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Abstract— The "Cantu a Tenore" is a typical artistic expression from Sardinia Italy, which is also recognized by UNESCO as one of the ICH (Intangible Cultural Heritage), those "traditions or living expressions inherited from our ancestors" to be passed down to our descendants. The transmission modalities of the rare know behind "Cantu a Tenore" is progressively changing. Can digital technology affect the way this particular type of singing is/can be transmitted? For sure, it is gradually becoming and, what's more important, is increasingly being "felt" as a suitable means not only to spread knowledge but also to sustain the transmission process itself. In particular new possibilities are opened by the adoption of cutting the edge sensor technologies as proposed by the I-treasures EU project, which proposes novel methodologies and new technological paradigms for the analysis and modeling of a variety of different ICHs, including the "Cantu a Tenore".

Index Terms— Intangible Cultural Heritage, Transmission, Preservation, Digital Technologies, Cultural Heritage Education, Cantu a Tenore.

I. THE CANTU A TENORE

The *Cantu a Tenore* is a typical singing expression from Sardinia- Italy which is listed in the "*Representative List of the Intangible Cultural Heritage of Humanity*" [1]. Many people in Sardinia claim that this traditional singing is native and dates back to the nuragic era. At present it is practiced in the central areas of the island of Sardinia and basically it is orally "*passed down*" being its transmission based on practicing together with peers, looking at and listening to the master singers.

The *Cantu a Tenore* is a four-part form of polyphonic singing; the choir is composed of four singers with different roles: a soloist (the "*boghe*"), who sings the text of a poetry, and a three-part accompanying choir ("*su bassu, sa contra, su mesu boghe*") which supports the soloist using nonsense syllables. Since, to date, the *Cantu a Tenore* has been mainly transmitted orally, it doesn't rely on rigid schemes, written scores or preset melodies.

II. DIGITAL TECHNOLOGIES AND THE TRANSMISSION OF CANTU A TENORE

Recently, net technologies have already proved to be potentially effective catalyzers for furthering the spreading of knowledge around the *Cantu a Tenore*. Twitter, Facebook and My Space are also important means to sustain the diffusion of the culture related to this type of singing: different pages and several thematic groups exist that are quite active and populated; they offer the possibility to discuss around specific issues, provide suitable links and offer the possibility to listen to a variety of performances.

Lately, *Cantu a Tenore* is also being studied in the framework of the European Integrated Project i-Treasures. This project, which is part of the work programme for the ICT theme (Information and Communication Technologies) of the FP7, is making an in-depth use of cutting the edge ICT and sensor technologies to support the transmission of the rare know how behind ICHs and to facilitate the mastering of related abilities and competences so to enhance the "preservation" of this ICH and the passing down of the rare know how behind it. In particular, in i-Treasures relevant and detailed information on the *Cantu a Tenore* is obtained from expert performers and researchers in the field by means of interviews and dedicated questionnaires. Based on this information, key aspects and features of this ICH are "captured" by using advanced ICT and sensor technologies: e.g.: 1) the specific vocal emission is analyzed by tracking the vocal tract of the singers during performance; 2) body motion, posture and movements are detected, coded and registered by means of advanced motion capture techniques; 3) interactions among singers are studied and emotion during performance are detected through Encephalogram analysis. A thorough process of modeling the available data is then carried out by relying on advanced Semantic Multimedia Analysis techniques.

This process allows acquiring an in-depth view of the various aspects and technicalities underpinning the *Cantu a Tenore* and, what's more important, also allows reproducing the involved mechanisms and basically shaping and directing the learning process of apprentices (also trough avatars assuming the role of virtual exemplar performers). These new affordances take us far beyond the idea that ICT can serve the scope of spreading information and enriching content with multimedia assets. This can rather be considered an example of how can effectively contribute to sustaining the learning and transmission of rare singing / cultural expressions.

UNESCO (2008) Lists of intangible cultural heritage and Register of best safeguarding practices Retrieved 24/06/2013 at http://www.unesco.org/culture/ich/index.php?lg=en&pg=00559