TURKISH FOLK MUSIC PHONETIC NOTATION SYSTEM DATAMATRIX CHARACTERISTICS/TFMPNS DC: URFA REGION SAMPLE

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Abstract

Datamatrix which was developed by Japanese Denso firm in 1994 is a type of two-dimensional barcode which can be scanned with the digital camera of mobile devices. Datamatrix application which is based on Near Field Communication/NFC was designed for contactless/fast/secure communication between electronic devices in close distances. Thanks to the datamatrix coding system, every kind of limitless content transfer such as information/message/video etc can be done in a limited area. Recorded images are analyzed and barcode content directs users to internet/e-mail address-telephone number-sms/mms/geographical location information. Through datamatrix technology whose existence and utilizability has been verified in various fields, descriptive information can be encoded rapidly and practically. In musical training and education technology as well as in the material and equipment developing process, musicologists have declared that the datamatrix coding system can be used as visual/auditory alternative transfer or adaptation instrument which fulfills the function of making rapid and active connection and communication between physical reality and virtual reality. Any kind of literary and musical texts as well as voice records of Turkish folk music, which is defined as a kind of verbal/artistic performance, can be encoded in the axis of performance theory which is one of the folklore analysis models and linguistical approaches in ethnomusicology.

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1. Introduction

1.1. Turkish Folk Music Phonetic Notation System Database (TFMPNS D)

Turkish folk music has a privileged place in music types due to regional dialect varieties. The future of Turkish folk music depends on the protection of its genus originating from dialect differences and its resistance against change. The regional dialect properties of Turkish folk music are transcribed by Standard Turkey Turkish (STT) and Turkish Linguistic Institution Transcription Signs (TLITS) depending on linguistic laws in axis of phonetics, morphology and parole existence. On the other hand, depending on musicological laws, regional dialect properties of Turkish folk music which is a verbal/artistic performance type structured in axis of linguistic approaches in ethnomusicology-performance/display theory are also transcribed by STT and TLITS. It is determined and approved by linguistic/musicology sources and authorities that this reality which is also present in other world languages can be transferred to notation and vocalized again and again in accordance with its original sources through International Phonetic Alphabet (IPA), the existence and usability of which have been registered by local and universal standards. through the notification that will be submitted (Radhakrishnan, 2011, pp. 422-463).

Turkish Folk Music Phonetic Notation System (TFMPNS) is an example of a notation system which aims to initiate a parallel application to the international linguistic/musicological application foundations which were laid out under the scope of the Istanbul Technical University's Institute of Social Sciences Turkish Music postgraduate program which is configured in phonetics/morphology/lexicon axis together with traditional/international attachments based on STT which is the standard language/standard variant recognized and adopted in a community as a means of agreement among the regions. This gains a dominant position by becoming dialects widely spoken and which has a significant function among language types and usage areas as a means of communication among speakers of different dialects (Demir, 2002, pp. 105-116). Turkish Linguistic Institution Transcription Signs (TLITS) refer to transcription marks used to transcribe local oral features existing on the axis of phonetics/morphology/lexicon criteria and theoretical/performance infrastructure of local oral texts, collected through the comprehensive compilation work on Anatolian dialectology (TLI, 1945, pp. 4-16) and the IPA which refers to the standard alphabet type consisting of signs and symbols. This was developed with the aim of redacting sound values in international standards, encoding speech sounds of all languages in an exemplary manner, and preventing confusion engendered with numerous transcription systems by providing correct pronunciation of languages and developing a separate symbol for each sound (IPA, 1999; Demir, 2011) (See Figure 1 and Table 1-2).
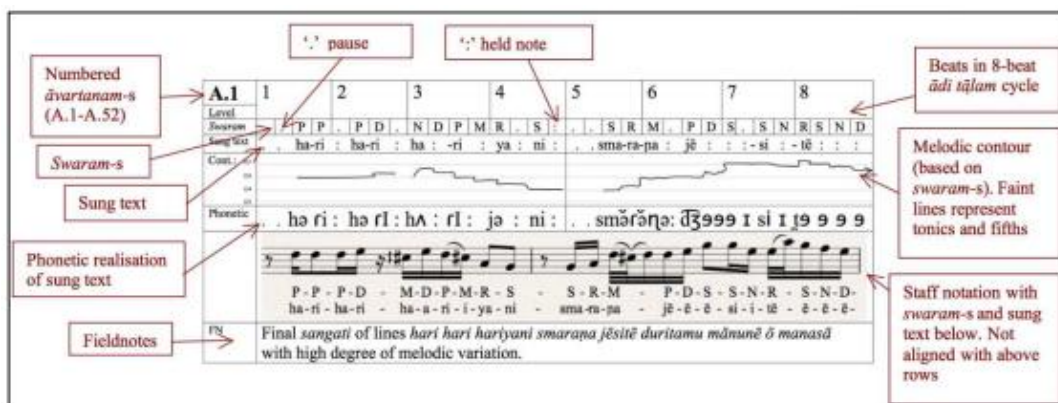

Figure 1. Musicolinguistics graphic sample (Radhakrishnan, 2011, pp. 423-463)

Table 1. Turkish Folk Music Phonetic Notation System Phonotactical Awareness Skills Development Processes/TFMPNS PASDP

Gele gele geldik bir kara taşa/ɟɛlɛ ɟɛlɛ ɟɛldic bir kɑrɑ tɑʃɑ
Gele gele geldīm bir ḳara daşa/Gɛlɛ gɛlɛ gɛldŭm bir kɑrɑ dɑʃɑ

Region: Urfa
Taken From: Mukim Tahir
Compiled & Noted: Muzaffer Sarısozen
Reader: Tenekeci Mahmut Guzelgoz
TRT TFM Repertoire Sequence Number: 701

Standard Turkey Turkish/STT	International Phonetic Alphabet/IPA	Turkish Language Institution Transcription Signs/TLITS	International Phonetic Alphabet/IPA
Gele gele geldik bir kara taşa	ɟɛlɛ ɟɛlɛ ɟɛldic bir kɑrɑ tɑʃɑ	Gele gele geldīm bir ḳara daşa	Gɛlɛ gɛlɛ gɛldŭm bir kɑrɑ dɑʃɑ
Yazılanlar gelir sağ olan başa aman efendim	jazɯlanlɑr ɟɛlir saː ołan bɑʃɑ aman efɛndim	Yazılanlar gelīr sağ olan başa aman efendīm	jazɯlanlɑr gɛlŭr sag ɔlan bɑʃɑ aman ɛfɛndŭm
Bizi hasret koyar kavim kardaşa	bizi hasrɛt kojɑr kavim kɑrdɑʃɑ	Bīzī ḥesret ḳoydı ḳavım kardaşa	Bŭzŭ ḥɛsrɛt kɔjdu kavum kɑrdɑʃɑ
Bir ayrılık bir yoksulluk bir ölüm aman efendim	bir ajrɯłuk bir joksułłuk bir ølym aman efɛndim	Bir ayrılıḫ bir yoḫsıllıḫ bir ölüm aman efendīm	Bir ajrɯluχ bir jɔχsulluχ bir ǣlim aman ɛfɛndŭm
Nice sultanları tahttan indirir	nidʒɛ sułtanłɑrɯ tahttan indirir	Nice Sülėymanları taḫtan ėndīrīr	Nid͡ʒɛ ʃǣlejmanlɑrɯ tɑχtan endŭrŭr
Nicesinin gül benzini soldurur aman efendim	nidʒɛsinin ɟyl benzini sołdurur aman efɛndim	Nicesīnīn gül benzīnī soldırır aman efendīm	Nid͡ʒɛsŭnŭn gyl bɛnzini sołduruɾ aman ɛfɛndŭm
Niceleri dönmez yola gönderir	nidʒɛlɛri dønmɛz joła ɟøndɛrir	Nicesīnī dönmez ėle gönderīr	Nid͡ʒɛsŭnŭ dænmɛz elɛ gændɛrŭr
Bir ayrılık bir yoksulluk bir ölüm aman efendim	bir ajrɯłuk bir joksułłuk bir ølym aman efɛndim	Bir ayrılıḫ bir yoḫsıllıḫ bir ölüm aman efendīm	Bir ajrɯluχ bir jɔχsulluχ bir ǣlim aman ɛfɛndŭm
Note 1. Transcription systems in Anatolia dialect researches: transcribed with Standard Turkey Turkish/STT in the axis of standard writing/transcription/variation method (Demir, 2010, pp. 93-106).	**Note 2.** IPA Turca: IPA provisions and sound description (Pekacar & Guner-Dilek, 2009, pp. 575-589) of the letters in Turkish alphabet in Rule-Based Turkish Phonetic Converter Program/RBTPCP (Bicil & Demir, 2012). Turkey Turkish Pronunciation Dictionary/TTPD phonology ABC's: transcribed with International Phonetic Alphabet/IPA (IPA, 1999) by the IPA correspondences of vowel and consonants (Ergenc, 2002, pp. 1-496).	**Note 3.** Linguistic approaches in ethnomusicology (Stone, 2008, pp. 51-53): phonetic writing usage in data recording in musicology: necessity of dialect documentation in linguistic and musicological axis: Urfa/Kerkuk/Tallafer Dialects Turkish Language Institution Transcription Signs/UKTD TLITS in the axis of phonetic notation method [Demir, 2011] of local dialect features of Turkish folk music: transcribed with vowels-consonants-distinctive signs (Ozbek, 2010, pp. iii-338).	**Note 4.** International Phonetic Alphabet/IPA usage in dialect researches of Turkish language: written dialect texts in Turkey by using IPA (TDK-IPA) provisions of transcription signs are transcribed with Standard Turkey Turkish/STT- Turkish Language Institution Transcription Signs/TLITS- International Phonetic Alphabet/IPA (Pekacar & Guner-Dilek, 2009, pp. 574-589).

Table 2. Turkish Folk Music Phonetic Notation Systems Phonotactical Therapy Applications/TFMPNS PTA

Gele gele geldik bir kara taşa/ɟɛlɛ ɟɛlɛ ɟɛldic biɾ kɑɾɑ tɑʃɑ
Gele gele geldĭm bir ḳara daşa/Gɛlɛ gɛlɛ gɛldŭm bir kɑɾɑ dɑʃɑ

Region: Urfa
Taken From: Mukim Tahir
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Standard Turkey Turkish/STT	International Phonetic Alphabet/IPA	Turkish Language Institution Transcription Signs/TLITS	International Phonetic Alphabet/IPA
Gele gele geldik bir kara taşa	ɟɛlɛ ɟɛlɛ ɟɛldic biɾ kɑɾɑ tɑʃɑ	Gele gele geldĭm bir ḳara daşa	Gɛlɛ gɛlɛ gɛldŭm biɾ kɑɾɑ dɑʃɑ

Note 1. Sound information criteria existing in the theory and application background of I. line of Turkish folk music literary/musical text: Standard Turkey Turkish/STT>International Phonetic Alphabet/IPA [a] wide, flat, soft palate (predorsal)>[ɑ] wide, flat, back palate (post dorsal)-[e] wide, flat, pre-tongue (closed)>[ɛ] wide, flat, pre-tongue (open)-[i] narrow, flat, odile (open)>[I]/[i] narrow, flat, pre-tongue (closed)-[b]>[b] voice, explosive, double-lip-[d]>[d] voice explosive, tongue tip is out-[k] voiceless, explosive, back palate>[c] chimes, front palate, explosive-[g] tone, front palate-mid-tongue, explosive>[ɟ] voice, explosive tongue-back palate (front)-[l]>[l] tone, gum, lateral fluent-[m]>[m] tone, double lip, nasal initial-[r] voice, multi-matrix, tongue tip-gum>[ɾ] voice, single matrix, tongue tip-gum [ɤ] voiceless, fricative-[ş]>[ʃ] voiceless, fricative, tongue-soft palate-[t]>[t] voiceless, explosive, tip end is out. Urfa/Kerkuk/Talaffer Dialects Turkish Language Institution Transcript Signs/UKTD TLITS>International Phonetic Alphabet/IPA: [ĭ] short unaccented, a vowel between i/ė>[ŭ] very short ı-[ḳ] a back palate consonant thicker, explosive and made further back than normal k constructing syllables with thin or thick vowels>[k] voiceless, rear palate, explosive.

CVCV CVCV CVCCVC CVC CVCV CVCV	CVCV CVCV CVCCVC CVC CVCV CVCV	CVCV CVCV CVCCVC CVC CVCV CVCV	CVCV CVCV CVCCVC CVC CVCV CVCV

Note 2. Form information criteria existing in theoretical and practical background in I. line of the Turkish folk music literary/musical text: V/C analysis (Gorman, 2013: 39-63): V=vowel (vowel letter), C=consonant (consonant letter). When V/C analyzing method is applied to all lines of the folk music text, differences in the axis of sound/syllable/word/sentence orders may arise.

Gele gele (ge.le ge.le) gel.dik bir ka.ra ta.şa	ɟɛlɛ ɟɛlɛ (ɟe.lɛ ɟe.lɛ) ɟel.dic biɾ kɑ.ɾɑ tɑ.ʃɑ	Gele gele (ge.le ge.le) gel.dĭm bir ka.ra da.şa	Gɛlɛ gɛlɛ (Gɛ.lɛ gɛ.lɛ) gɛl.dŭm biɾ kɑ.ɾɑ dɑ.ʃɑ

Note 3. Syntactic criteria of sound/syllable/word/sentence existing in theoretical and practical background of the I. line of the Turkish folk music literary/musical text: prosodic phonotactical analysis (Sherer, 1994): (.) = represents the syllabic segmentation points. When prosodic phonotactical analysis method is applied to all lines of the folk music text, differences may arise in the acoustic/syllabic/word/sentential partitioning/impact points axis in terms of linguistic/rhythmic-music scientific/melodic prosody overlap rules.

Turkish Language Institution Dictionary Database/TLI DD	Turkey Turkish Pronunciation Dictionary/TTPD	Urfa/Kerkuk/Tallafer Dialects Index and Dictionary/UKTD ID	Turkish Folk Music Phonetic Notation System Dictionary Database/TFMPNS DD
gele: gele (TLI TAD)-gele (TLI BTD)-gelsin (TLI CDFDT/TTDD)-gel, hele gel, haydi gel (TLI SD).	ɟe'lɛ: gele > ɟe'lɛ	gele: to come, reaching a place, to arrive.	gele/ɟe'lɛ/gele
geldik: geldi-k (TLI BTD).	ɟe'ldIc: gel > ɟe'l-dIc	geldĭm: to come, reaching a place, to arrive	geldik/ɟe'ldIc/geldĭm
bir: bir (TLI STS)-bir (TLI CTD)-ber/bi (TLI TTDD)-bir (TLI SD).	'bIɤ: bir > 'bIɤ	bir: name of the number, the title of uncertainty.	bir/bir/bir
kara: kara (CTD)-kara (TLI TTDD)-kara (TLI SD).	kɑ'ɾɑ: kara > kɑ'ɾɑ	ḳara: black, dark, bad, distressed, mourning.	kara/kɑ'ɾɑ/ḳara
daşa: taş (TLI CTD)-taş (TLI TTDD)-daş (TLI SD).	'tɑʃɑ: taş-a > 'tɑʃ-ɑ	daşa: stone.	daşa/'tɑʃɑ/daşa

Note 4. Word existence criteria existing in the theoretical and practical background of I. line of the Turkish folk music literary/musical text: Turkish Language Institution Dictionary Database/TLI DD (Url <http://www.tdk.gov.tr>), Urfa/Kerkuk/Tallafer Dialects Index and Dictionary/UKTD ID (Özbek, 2010, pp. 113-253), Turkey Turkish Pronunciation Dictionary/TTPD (Ergenç, 2002, pp. 46-47), Turkish Folk Music Phonetic Notation System Dictionary Database/TFMPNS DD in the axis of transcripted with Standart Turkey Turkish/STT-Turkish Language Institution Transcription Signs/TLITS-International Phonetic Alphabet/IPA.

1.2. Datamatrix Coding System (DCS)

Datamatrix technology (quick response/qr code-data matrix: 2D barcode technology) is a kind of two-dimensional special matrix barcode which can be read or scanned with digital camera of data matrix mobile devices. The code developed by the Japanese Denso firm in 1994 is generally composed of black motifs on square white background (Url <http://www.qrcode.com/en/about/>). Recorded images are analyzed and barcode content directs users to internet/e-mail address-telephone number-sms/mms/geographical location information. Datamatrix application based on Near Field Communication (NFC) was designed for contactless, fast, and secure communication between electronic devices in close distances (Örücü, 2013, pp. 259-267; Polat, 2014, pp. 1-8). Thanks to the datamatrix coding system, a variety of limitless content transfer such as information, messages, and video can be done in limited areas. Through datamatrix technology (high frequency, short distance wireless communication technology) whose existence and utilizability were registered in various fields, descriptive information can be encoded rapidly and practically (Aktas, 2013, pp. 118-128). The term datamatrix was first used in Medicinal Products for Human Use Barcode Application Guide. Data matrix application which was defined as two-dimensional, GS1 compliant square or rectangle printed datamatrix barcode which has become compulsory in various sectors since October 1, 2009 in Turkey (Url <http://tr.wikipedia.org/wiki/Karekod>). Datamatrix standards were stated in many documents such as October 1997 AIM International-January 1999 Japanese standard code JIS X 0510-June 2000 ISO/IEC 18004: 2000-September 2006 ISO/IEC18004. Moreover Japanese NTT DoCoMo firm determined standards for different data types. Open source "ZXing" project includes datamatrix types (Url <http://tr.wikipedia.org/wiki/QR_kodu>).

Datamatrix data capacity covers one-dimensional classical barcode types which include unidirectional data as well as two-dimensional special matrix barcode which include multi-directional/high capacity data in horizontal/vertical axis. It has the capacity to encode every kind of data such as datamatrix digital data (0-9), alpha numerical data (0-9), uppercase data (A-Z), other nine characters data (space, $ % * + - . / :), symbol data (Kanji-Kana-Hiragana Japanese symbols), 8 bits binary digits data, and control codes data. In a datamatrix symbol, nearly 7089 characters can be encoded (ISO/IEC 18004, 2000 & Law & So, 2010: 85-86). Due to being read 360° (omnidirectional/high speed) and store high capacity data, they differ from other barcode types. This process is conducted with position determination structures located on three corners of the symbol. Datamatrix technology can be used through communication tools which have internal camera and all devices which have the characteristics of data matrix reading programs or applications. Matrix can be attained for free by thousands of free software applications. It can be attained through unpaid software by individuals who are listed in data matrix user profile (Aktas & Çaycı, 2013, pp. 259-267; Al-Khalifa, 2008). (Url <http://www.qrcode.com/en/about/> & <http://tr.wikipedia.org/wiki/QR_Code>).

As for the characteristics of datamatrix structure, the version information defines the version of the data matrix. Data storage capacity and error correction level of each code is different and as the stored data increases so does the versions. Format information includes 15 bit long error correction levels and mask pattern indicator. Scanner first of all reads the information here. Encoded data: data matrix is stored in this area. Data are stored by transferring '0' and '1' binary numbers into white and black cells. This data area is read by the scanner. Required template; detection template: direction, size and symbol angle are determined with this structure on three corners of code. It enables the code to be read omnidirectional (360

degrees) and high speed. Alignment template: It is quite effective in correcting skewness in datamatrix. Scanner detects error in skewness occurring in datamatrix and makes necessary corrections. Timing template: black and white structure within detection templates. Central coordinate information of each cell is determined with two kinds of patterns. When the code is bent/error occurs in cells, the center of cell corrects horizontal/vertical coordinate. Silent zone: the empty space where there is no data around datamatrix. Nothing is written or entered in this area. Each dot represents 1 module. It is 4 modules wide at least. Due to empty space, code is read without problem (Url <http://aylincsknn.blogspot.com.tr/2012/08/qr-kod-cagn-barkodu-olarak-anlan-qr_11.html>).

Datamatrix scanning process is composed of five steps. In the first step, gray level is calculated. In the second step, marked three corner points are detected by its detector. In the third step fourth corner is estimated with special algorithms. In the fourth step, inverse transformation is enabled by making use of existing corner points in order to normalize code length. In the fifth step code is deciphered by making scanning (Aktas & Çaycı, 2013, pp. 259-267; Polat, 2014, pp. 1-8).

Datamatrix reading process is composed of six steps. In the first step, datamatrix reader type/version is chosen. In the second step datamatrix scanner loading/downloading process is completed. In the third step, datamatrix is defined with the software uploaded. In the fourth step, recorded datamatrix is analyzed and contents are provided (internet-email address/telephone number/sms-mms-geographical position information etc.). In the fifth step, tabs in applications options (scan/profile/history/inbox/share/settings/about/other: favorite common files/resolve image/manual code enter/resolve from URL address/short URL/XOR codes/tips and tricks/evaluate application/share QR Droid etc.) are adjusted. In the sixth step, information about contents (web search/store/copy/share/information/edit etc.) is detailed. (Url< https://play.google.com/store/apps/details?id=la.droid.qr&hl=tr&rdid=la.droid.qr>) & (Url <http://www.qrkod.org/>).

Datamatrix formation options are found in various websites which provide free datamatrix formation service together with local/universal correlations in theoretical/executive infrastructure of World Wide Web/WWW electronic communication network. Datamatrix formation processes are completed with upload of necessary software/hardware data (Url <http://www.qrkod.org/> & Url <http://qrkod.gen.tr/> & Url <http://tr.qr-code-generator.com/> & Url<http://karekodolustur.com/> & Url <http://www.qrkodturkiye.com/> & Url <http://www.sembolbarkod.net/sembol-karekod-olusturma/>).

Datamatrix archive options can also be found in various websites which provide free datamatrix archive service together with local/universal correlations in theoretical/executive infrastructure of World Wide Web/WWW electronic communication network. QR Code Turkey which operates at local scale: Turkey Datamatrix Code Archive/TKKA; It is a database formed with the name of Qr Code Turkey in order to enable participation to datamatrix archive by adding datamatrix of firms to web site according to sectors, enable backlink to firms in google ranking/search engine optimization, enable quick communication with web sites to site users who works as firm guide. To add datamatrix in archive; firm name, telephone number, e-mail, web site, Qr code, firm logo, security code should be uploaded to system database. All the data/information/files entered in Add Qr Code Archive Form are kept secret and recorded in archive in order to use (Url<http://www.qrkodturkiye.com/>) (See Figure 2).

Figure 2. Qr Code Turkey: Turkey Datamatrix Archive/TDA: datamatrix code archive-What is QR code and how it works-creative QR code examples-add QR code to archive. Form QR code: coding UTF-8, Shift_JIS, ISO-8859-9, size: 150x150, level: L, M, Q, H. (Url <http://www.qrkodturkiye.com/>)

2. Turkish Folk Music Phonetic Notation System Datamatrix Characteristics (TFMPNS DC)

Musical education and training technology and material and equipment development processes was defined as visual, auditory alternative transfer or adaptation instrument which fulfill the function of making fast, active connection and communication between physical reality and virtual reality (Baik, 2012, p. 434; Gunay & Ozdemir, 2006, pp. 31-33). In the axis of phonological/morphological/rhetorical approaches, in the level of phonological/morphological/lexical criteria together with local/universal correlations can be used as an alternative instrument/material/equipment in transfer/adaptation/transmission processes about datamatrix coding system especially options of forming url/text in the process where visual/auditory/cognitive data which sustain in theoretical/executive infrastructure of vocal/instrumental notation system type and forms are insufficient (Kücük, 2014, pp. 1-8). The first two studies which are examples of datamatrix coding system in musical educational/instructional applications in Turkey are written with the title of "Giresun Folk Dances-An Ethnochoreological Evaluation" and "A new Suggestion in Dance, Music and Instrument Making Education: Datamatrix" by Ege University State Turkish Music Conservatory Turkish Folk Dances Department Lecturer İdris Ersan Kücük (2015, pp. 15-16) (See Figure 3).

Figure 3. Datamatrix 1-2-3-4: Giresun region performance examples (Kücük, 2014, pp. 4-5).

Turkish Folk Music Notation System Datamatrix Characteristics/TFMPNS DC & Turkish Folk Music Notation System Datamatrix Archive/TFMPNS DA formation/development processes will be encoded with the option of Turkish Folk Music Phonetic Notation System Database/TFMPNS D type and forms datamatrix coding system characteristics "form url/text" which exists in theoretical/executive infrastructure of Turkish Folk Music Phonetic Notation System Website/TFMPNS W. Standard Turkish/STT-Turkish Language Institution Transcription Signs/TLITS-International Phonetic Alphabet/IPA grapheme/phoneme criteria type and forms which exist in theoretical/executive infrastructure of Turkish Folk Music Notation System Alphabet Database/TFMNS AD will be encoded with datamatrix coding system "form url" option. 128 Urfa Turkish folk music literary/musical text transcription type and forms which exist in theoretical/executive infrastructure of Turkish Folk Music Notation System Work Database/TFMPNS WD will be encoded with datamatrix coding system characteristics "form text" option. 128 Urfa Turkish folk music literary/musical text sound records which exist in theoretical/executive infrastructure of Turkish Folk Music Phonetic Notation System Sound Database/TFMPNS SD will be encoded with datamatrix coding system characteristics "form url" option. Turkish Language Institution Dictionary Database/TLI DD-Turkey Turkish Pronunciation Dictionary Database/TTPDD-Urfa/Kerkük/Tallafer Dialects Index and Dictionary Database/UKTD DD-UCLA Phonetic Laboratory Archive Turkish Language Database/UCLA PLA TLD type and forms which exist in theoretical/executive infrastructure of Turkish Folk Music Phonetic Notation System Dictionary Database/TFMPNS DD will be encoded with datamatrix coding system characteristics "form url" option. Moreover datamatrix coding system data capacity which has the capacity to encode every kind of data such as datamatrix digital data (0-9), alpha numerical data (0-9), uppercase data (A-Z), other nine characters data (space, $ % * + - . / :), symbol data (Kanji-Kana-Hiragana Japanese symbols). 8 bits binary digits data, control codes data. In a datamatrix symbol, nearly 7089 characters can be encoded (ISO/IEC 18004, 2000 & Law & So, 2010: 85-86) should be extended in a way that would encode Turkish Folk Music Phonetic Notation System Datamatrix Characteristics/TFMPNS DC. Turkish Folk Music Phonetic Notation System Datamatrix Characteristics/TFMPNS DC & Turkish Folk Music Phonetic Notation System Datamatrix Archive/TFMPNS DA transfer/adaptation processes to educational/instructional processes; characteristics of datamatrix coding system should be used as visual/auditory alternative transfer/adaptation instrument/material for individuals participating in Turkish Folk Music Phonetic Notation System User Profile/TFMPNS UP be directed/transferred to all sub-databases/data rapidly/actively which exist in theoretical/executive infrastructure of Turkish Folk Music Phonetic Notation System Database/TFMNS D (See Figure 4).

Figure 4. Turkish Folk Music Phonetic Notation System Datamatrix Characteristics/TFMPNS DCGele Gele Geldĭm Bir Ḳara Daşa Datamatrix formation: text: datamatrix settings: coding: UTF-8, size: 300x300, correction level: L%7. (Url <http://www.qrkod.org/qr-kod-metin.php>)

3. Conclusion

Any kind of literary/musical texts and voice records belonging to Turkish folk music which is defined as a kind of verbal/artistic performance in the axis of performance theory (every kind of folkloric term/concept/element-folklinguistical variant/alternate/range in the axis of ethnological) which is one of the foklore analysis models and linguistical approaches in ethnomusicology (every kind of ethnomusicologic term/concept/element-ethnomusicolinguistical variant/alternate/range in the axis of ethnomusicological) should be encoded in the frame of Datamatrix Coding System/DCS and their formation/development stages and transfer/adaptation process to educational/instructional application should be done to Turkish Folk Music Phonetic Notation System Datamatrix Characteristics/TFMPNS DC (Standard Turkey Turkish/STT-Turkish Language Institution Transcription Signs/TLITS-International Phonetic Alphabet/IPA grapheme/phoneme criteria type and forms datamatrix coding system characteristics, 128 Urfa Turkish folk music literary/musical text transcription type and forms datamatrix coding system characteristics, 128 Urfa Turkish folk music literary/musical text sound records datamatrix coding system characteristics, Turkish Language Institution Dictionary Database/TLI DD-Turkey Turkish Pronunciation Dictionary Database/TTPDD-Urfa/Kerkük/Tallafer Dialects Index and Dictionary Database/UKTD DD-UCLA Phonetic Laboratory Archive Turkish Language Database/UCLA PLA TLD

type and forms datamatrix coding system characteristics & Turkish Folk Music Phonetic Notation System Datamatrix Archive/TFMPNS DA (Turkish Folk Music Phonetic Notation System Database/TFMPNS D type and forms datamatrix coding system which exists in theoretical/executive infrastructure of Turkish Folk Music Phonetic Notation System Website/TFMPNS W).

Datamatrix application can be used actively to integrate educational/instructional applications for individuals included in Turkish Folk Music Phonetic Notation System User Profile/TFMPNS UP & Turkish Folk Music Phonetic Notation System Visually Impaired User Profile/TFMPNS VIUP & Turkish Folk Music Phonetic Notation System Hearing Impaired User Profile/TFMPNS HIUP.

Acknowledgements

References

Aktas, C. (2013). Media convergence: A discussion on increasing competition of traditional newspaper with online newspaper through quick response code. *Selcuk Communication Journal, 7*(4), *2148-2941*. Retrieved from https://cdn.istanbul.edu.tr/statics/unibasin.istanbul.edu.tr/wp-content/uploads/2015/03/INMC-2012_Kitap.pdf#page=17

Aktas, C., & Çaycı, B. (2013). Contribution of Qr code in new education methods of mobile education. Retrieved on 10 July, 2015 from http://globalmediajournaltr.yeditepe.edu.tr/makaleler/ GMJ_7._sayi_Guz_2013/pdf/Aktas_Cayci.pdf

Al-Khalifa, H. S. (2008). Utilizing Qr code and mobile phones for blinds and visually impaired people computers helping people with special needs. *11th International Conference. ICCHP, Linz, July 9-11*, Austria. Retrieved on 10 July, 2015 from http://www.inlcs.org/online/Book17.pdf

Baik, S. (2012). Rethinking QR code: analog portal to digital world. *Multimedia tools and applications, 58*(2), 427-434. https://doi.org/10.1007/s11042-010-0686-9

Bicil, Y., & Demir, G. (2012). IPA Turca: Rule-based phonetic converter program/KTTFDP. *TUBITAK National Electronics and Cryptology Research Institute of Multi-Media Technology Research and Development Laboratory*, Gebze/Istanbul.

Demir, G. (2011). Phonetic notation of local dialect features of Turkish folk music formed in language-music relationship Axis. *Master Thesis of Istanbul Technical University Social Sciences Institute of Turkish Music Program*, Istanbul, Turkey.

Demir, N. (2002). Ağız terimi üzerine [On dialect term]. *Turkbilig Press*, *4,* 105-116. Retrieved from https://dergipark.org.tr/en/pub/turkbilig/issue/52779/696897

Demir, N. (2010). On variations in Turkish. *Ankara University Language and History-Geography Department, Turcology Journal, 17(2).*

Ergenc, I. (2002). *Speaking language and Turkish usage dictionary.* Istanbul: Multilingual Foreign Language Publications Baskı Printing.

Gorman, K. (2013). Generative phonotactics. Published Doctor of Philosophy Thesis. *The University of Pennsylvania Linguistic Department*, Pennsylvania.

Gunay, E., & Ozdemir, M. A. (2006). *Music education technology and material development.* İstanbul: Bağlam Publications.

IPA. (1999). *Handbook of the international phonetic association: A guide to the use of the international phonetic alphabet.* Cambridge: Cambridge University Press.

Kücük, I. E. (2014). Use of datamatrix coding system in dance, music and instrument making education. İzmir II. *National Music Symposium, 17-18 November 2014, Ege State Turkish Music Conservatory, Ege University Campus*, Bornova/İzmir.

Kücük, I. E. (2015). Giresun folk dances-an ethnochoreological evaluation. *Ege University Printing*, İzmir.

Law, C. Y., & So, S. (2010). QR codes in education. *Journal of Educational Technology Development and Exchange, 3*(1). https://doi.org/10.18785/jetde.0301.07

Murkute, J., Nagpure, H., Kute, H., Mohadikar, N., & Devade, C. (2013). Online banking authentication system using qr-code and mobile OTP. *Int. J. Eng. Res. Appl, 3*(2), 1810-1815.

Örücü, A. İ. (2013). Bir Vergi Ödeme Aracı Olarak Karekod Teknolojisi [Datamatrix Technology as an Instrument of Tax Payment]. Maliye Dergisi/ *Finance Journal, 164*, 259-267.

Ozbek, M. A. (2010). Language and Expression Properties of Urfa Songs. *Istanbul University Social Sciences Institute of Turkish Language and Literature Department New Turkish Science Branch, (unpublished PhD thesis)*, Istanbul/Turkey.

Pekacar, C., & Guner-Dilek, F. (2009). International phonetic alphabet and dialect researches in turkey. *Dialect Research of Turkey Turkish Workshop (25-30 March 2008 Sanlıurfa), Ataturk Culture, Language and History Institute TLI Publications, vol. 989*, Ankara.

Polat, Z. A. (2014). Thoughts on possible use of datamatrix technology in our profession. *V. Remote Sensing and Geographical Information Systems Symposium (UZAL-CBS 2014), 14-17 October 2014*, İstanbul.

Radhakrishnan, M. (2011). Musicolinguistic artistry of niraval in carnatic vocal music. *Australian National University/ANU Research Repository Proceedings of the 42nd Australian Linguistic Society Conference*, Australia.

Sherer, T. D. (1994). Prosodic phonotactics. *Doctor of Philosophy Thesis, The Graduate School of the University of Massachusetts Amherst Department of Linguistics*, Amherst.

Stone, R. M. (2008). Theory for ethnomusicology. Upper Saddle River, NJ : Pearson Prentice Hall.

TLI. (1945). Turkish dialects transcription system. *Cumhuriyet Printing House*, Istanbul. (Arat, R. R. 1946. Turkish scientific transcription manual. *İstanbul University Literature Faculty, T.C. Ministry of National Education, National Education Printing House*, Istanbul).

Url <http://karekodolustur.com/> (Access Date: 05.06.2015).

Url <http://qrkod.gen.tr/> (Access Date: 03.06.2015).

Url <http://www.qrkod.org/> (Access Date: 10.06.2015).

Url <http://www.qrkod.org/qr-kod-metin.php**>** (Access Date: 07.05.2015).

Url <http://www.qrkodturkiye.com/> (Access Date: 25.04.2015).

Url <http://tr.qr-code-generator.com/> (Access Date: 15.04.2015).

Url <http://tr.wikipedia.org/wiki/Karekod**>** (Access Date: 10.06.2015).

Url <http://tr.wikipedia.org/wiki/QR_kodu**>** (Access Date: 19.06.2015).

Url <http://www.qrcode.com/en/about/> (Access Date: 18.05.2015).

Url <http://tr.wikipedia.org/wiki/Sembolizm> (Access Date: 30.05.2015).

Url <http://tr.wikipedia.org/wiki/Sembol> (Access Date: 22.07.2015).

Url <http://tr.wikipedia.org/wiki/Barkod> (Access Date: 06.07.2015).

Url <http://tr.wikipedia.org/wiki/QR_Code> (Access Date: 25.07.2015).

Url <http://www.sembolbarkod.net/sembol-karekod-olusturma/**>** (Access Date: 09.07.2015).

Url <http://www.tdk.gov.tr> (Access Date: 13.07.2015).

Url<https://play.google.com/store/apps/details?id=la.droid.qr&hl=tr&rdid=la.droid.qr> (Access Date: 30.06.2015).

Url <https://play.google.com/store/apps/details?id=la.droid.qr&hl=tr**>** (Access Date: 26.07.2015).

Url<http://aylincsknn.blogspot.com.tr/2012/08/qr-kod-cagn-barkodu-olarak-anlan-qr_11.html> (Access Date: 08.07.2015).

Url<http://tr.wikipedia.org/wiki/Dosya:Taggingprozess.jpg> (Access Date: 13.07.2015).

Url<http://www.trtnotaarsivi.com/thm_detay.php?repno=701&ad=GELE%20GELE%20GELD%DDK%20B%DDR%20KARA%20TA%DEA> (Access Date: 10.02.2015).