



Digital Preservation of Haitian Mythology Music Notation

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Digital Preservation of Hatian Mythology Music Notation

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for the Degree of Master of Liberal Arts in Extension Studies

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Abstract

This project aims at preserving Haitian mythology music; it is conceptualized as having two components:

- **Digital Preservation Archive:**. The process generates equivalent notation of hardcopies as well as supplementary audio clip. The resulting artifacts are archived in a website.
- **Music Production Using Media Technologies:** is an effort to stimulate interest in the music. Digital media technologies are applied toward arranging mythology songs for small Afro Western styled musical group. We design a workflow for notating, recording, and staging the music.

Dedication

To the victims and survivors of the 2005 hurricane Katrina and the 2010 Haiti earthquake catastrophes

Acknowledgments

The work of Dr Wayne Marshall is invaluable. Many thanks!

This thesis was made possible by the willingness of Dr Jeff Parker to serve as technical consultant. Thank you.

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Chapter 1 Introduction

The expanding American art form known as Jazz greatly owes its evolution to the application of sound reproduction technologies very early in the propagation of audio production. Sound recordings of various Afro American performers in early music production industry have greatly contributed to the preservation and proliferation of genres such as folkloric blues, ragtime, and spirituals which have evolved into many versions of rhythm and blues, jazz (aka blues), funk, and others. This acknowledgement serves to demonstrate that the preservation and evolution of music involve the element of production as well as the element of notation.

My objective is to apply digital technologies toward preserving music of Haitian Mythology by:

- Digitally preserving existing notation in an archive hosted by a website.
- Fostering music production while encouraging further notation by arranging Haitian songs that demonstrate the applicability and value of notations for Afro Western¹ music arrangements based on Jazz traditions. The arrangements are completed using available multimedia technologies for music in a workflow that can be used for hybrid musical performances as well as music productions media.

The preservation of Haitian Mythology may even be considered as the preservation of the root of jazz as implied on the New Orleans website that “In the late 19th century, while the rest of America was stomping their feet to military marches, and

New Orleans was dancing to Voodoo rhythms.” It is worth noting that jazz has progressed to its current forms from its historical dance format.

Until the publications of G. Fleurant in 1987, 1994, and 1996 Haitian Mythology music remained of interest to many but unapproachable due to rhythmic complications and unusual musical phrasing in its melodies when performed in its indigenous form. This multifaceted vibrant music is little explored in the modern Afro Western music context because even Western trained native musicians have difficulty in arranging and performing it. Hence, the music remains in its original settings and very limited in cosmopolitan possibilities.

By presenting the music in a systematic form Fleurant’s approach has simplified the complexities and opens the door for orchestral and small group arrangements. Fleurant’s publications are unique due to the author’s skill. The collective works, to this writer and others, is similar to the “Real Book” used in the Jazz community.

This project seeks to expand on Fleurant’s work by exploiting and applying affordances of the digital age to the above components of preservation hence expanding on the global stage that is set in said published works.

Another noteworthy effort underway is “The Vodou Archive” which is a joint project of Duke University and University of Florida that published an online collection of Haitian mythology lyrics taken from Max Beauvoir’s books published in 2008. Beauvoir compiled 778 songs in these publications partially comprising the Vodou Archives’ (mythological) music listing. This work however does not include music notation, music production, recorded performance, or discography; its primarily implied focus is on religious and spiritual practices.

¹ Afro Western is defined in the Chapter 4

In 2011 the New Orleans Jazz & Heritage Festival organizers honored the relationship of Haiti to New Orleans. The effort was symbolic to the objective of reconnecting Jazz to Haiti. The work of Alan Lomax who recorded 50 hours of media in Haiti circa 1936 was featured during this event. Much of the public domain material recorded in 1936 has already disappeared with the group that performed it because it was not formally produced making Lomax's work a good example of the value of preservation.

Some Creole songs were preserved in the United States in such works as Louis Moreau Gottschalk circa 1850. His sister, Clara Gottschalk Peterson published a song book in 1902 titled "Creole songs from New Orleans in the negro-dialect /set to music." The work of Dorothy Scarborough's "On the Trail of Negro Folk-Songs" published in 1925 also contains some Creole songs. All these publications are made of lyrics and melody notation.

The Vodou Archive also contains other publications of songs in addition to Beauvoir's compilation; an indication that this effort should grow into cooperation and participation. Fleurant's approach of separating the rhythm from the melody is important because Haitian Mythology music is comprised of more than 15 rhythms each with its own repertoire. The overall uniqueness of these songs can be attributed to the fact that these songs are composed from rhythm rather than western harmonic method resulting in musical phrasing that extends to the rhythm upon which the song is based. Rhythm is strict in ritual songs but has not been notated until Fleurant's work, thus opening the possibility of learning and applying them in Afro Western format while preserving the original musical cadence. This separation is referred to in this writing as Felurant's

method that also integrates the Mythological entities relating to songs. Mythological entities exist in a hierarchy useful for cataloging purposes.

In this phase of conceptualizing a digital repository for preservation only the work of Fleurant has songs with complete attributes namely melody with lyrics and corresponding rhythm. Consideration is given to songs that do not have all the attributes as they come from other sources. A song may be archived if it only has an audio recording or past production artifact such as hard copy notation. These nuances are treated under curator intervention

Onward, the songs in Fleurant's work will be categorized as authenticated songs.

In this category the attributes that qualify a song are:

1. The mythological entity name to which the song is attributed
2. The name of the song
3. The song's rhythm
4. The lyrics
5. The notation of each instrument of the rhythmic instrumentation.
6. The musical notation of the melody

The first 4 attributes constitute the basic requirement for songs to be listed in this database.

For growth potential, another category of songs is added to enable collection of songs by curator intervention. These songs are incomplete relative to the authenticated category; they are labeled cited songs and are expected to have the following attributes:

1. The mythological entity name to which the song is attributed (if applicable)
2. The name of the song
3. The lyrics of the song

4. A reference to an audio recording or performance of the song

Haitian Mythology is complex because it encompasses African beliefs and practices, Native American beliefs and practices, European Catholicism and practices, and shamanism.

There are many factions in the Mythology of which Vodun is a declared religion composed of rites that constitute a hierarchy. Rites use a subset of the rhythm pool; rhythms are not specific to rites.

The music of Haitian Mythology is not restricted to rituals; they are sung and performed like Christian spirituals and Afro American spirituals in Jazz, Blues, Country, etc... Haitian music is comprised of mythology music, public domain music, and popular music. They are all performed as entertainment music. Each type of these styles has a source; the ritual type is said to be composed by the mythological entities when they manifest or by initiates; this is the transcendental music of the Vodun religion. The public domain songs are derived from various sources and as said before comprises an extensive repertoire; public domain songs are composed on rhythms that are also used in ritual songs. In this project mythology music is defined as ritual and public domain music; the structure of popular music is not compliant to the structure of mythology music.

The source of popular music is the cosmopolitan groups or bands (called jazz) that play dance/club music. These groups/bands don't play from the mythological repertoire; popular music from the 1960s onward is rooted in neighboring Dominican, Puerto Rican, and Cuban music rather than Haitian Mythology music. English speaking Caribbean music was virtually unknown in Haiti until the 80s when reggae made its appearance via the music of Bob Marley.

This effort is an attempt in the digital age that is appropriately involving media technologies and a step toward the possibility of a complete approach involving archiving and multimedia technologies. The scattered sources referenced throughout this document signal a justification for institutional structured preservation that considers material from all sources. Such

effort should begin with identification of applicable resources to define a comprehensive curator component; this is revisited in the last chapter. This project may be a contributing component toward such institutionalized undertaking.

Chapter 2 Notation Archive Component

The archive component of this project is conceived to store music notation, audio rendering of the notation, and the necessary data for identification and usage. Melody notation PDF, audio of melody, rhythm notation PDF, and rhythm audio are generated from music notation software which is the foundation upon which the production component rests.

Digital Archive Description

The digital preservation of Haitian Mythology music notation up to now was limited to Fleurant's extensive and systematic work that compiles musical notations of one segment of Haitian mythology: the Rada rite. Mythological ritual songs are complex to notate because:

- Most of them are used exclusively in rituals
- The structure of the ritual environment is transparent to an outsider meaning that participants' role is difficult to detect.
- Singing is based on collective participation as opposed to a church choir
- Songs are repeated for long period and they are also chained
- Conversation is almost impossible over the loudness of the drums
- The rhythms are played fast with multiple drums

- The knowledge of playing ritual music is compartmentalized meaning the person with the full knowledge may be a priest or an initiated drummer.
- Revelations of necessary details come mostly through initiation because such details may be deemed sacred knowledge.

The overall ambience synthesized above is concisely summarized in Fleurant's work as follows:

“The Vodun dance ...has been more frequently observed and reported on than any other rites of the cult. It may appear disorganized and undisciplined, but above all, it is an integral part of the worship ...” Herskovits (1971)

The formal structure is summarized in the following

“The ritual has a sacerdotal hierarchy comprising of the Ougan and the Mambo, and their assistants the laplas, oungenikon and the outò, the last two being the drummers and chorus leader whose functions are crucial for the success of a ceremony.” Fleurant (1996)

The above description may be applicable to all rituals but the author also warns that:

“Vodun is, furthermore, too complex and sophisticated a socio-religious² system to attempt to discuss all of its rites under a single cover. Those interested in the study of music in context may soon realize that the complexities of other rites such as Petwo and its attendant secret societies, the Bizango and the Makanda warrant extensive studies of their own right.” (Fleurant 1996)

Haitian Mythology ritual music is not formally restricted to rituals; however there are exceptions to this rule as specified in the above revelation of “secret societies” that implies secrecy in the music as well. The general interest in the music does not extend to these exceptions; the music in these exceptions is most likely to be known only to members of those societies. Fleurant (1994) also offers caution in approaching the segment of ritual music that is available for purposes such as this project in the following.

² The original spelling is socioreligious

“Vodun songs are interpreted at two levels, the manifest and latent, or the surface and deep levels. Songs for the lwa can be interpreted at even deeper levels, depending of the interpreter’s degree of “konesans” or knowledge about ritual matters.”

The above caution is implied in this project and it also validates the compartmentalization mentioned above. The “manifest and latent” level applies to the Western notation of interest herein. The public domain songs that use rhythms of the ritual are played at the “manifest and latent” level when they are performed in native form.

Mythological ritual songs fall under the hierarchy of rite-entity; building the trust in an environment to learn and notate these songs is complex, as explained above, which makes the author’s work worthy. Fleurant is an initiate and priest of the Rada rite and as such is knowledgeable of its practices as well as the overall structure of the Vodun segment of Haitian Mythology. He offers a tabulation that encapsulates the relationships of rite, entities, songs, and rhythms which form the basis for this project’s data structure; the tabulation is concerned with the Rada rite only. The data structure is enhanced to comply with relational database paradigm and to facilitate expansion of the preservation of music of other rites as explained in chapter 1. We acknowledge that there might be exceptions or special cases to be reconciled if notation of other rites comes under consideration in the future.

The database schema (derived from said data structure) of this project implements the hierarchy of rite-entity that applies to ritual songs. There are ritual songs that do not belong to entities; they are performed for different activities in rituals. These songs are formally acknowledged in the preservation data structure as they lack hierarchical entity

which is a formal parameter in the data structure of the preservation database. These songs are treated in Fleurant's (1996) writing as listed below:

1. Songs for Oungan and Manbo
2. Songs for Ounsi Kanzo
3. Songs for Ountò and Oungenikon
4. Songs for Drapo or Flag
5. Song for Action/Direction and Chante Pwen

To progressively collect songs, the archive must facilitate preservation as well as growth with the necessary means for curator intervention. This means that in some cases, all components (melody, lyrics, and rhythm) may not be available simultaneously but can be obtained gradually through curator mechanisms as mentioned earlier.

The definition of a song is based on the elements that are necessary for its rendition namely melody, lyrics, rhythm. These elements also serve to establish authentication for the curator mechanism. Authenticated is defined as songs having all of its elements. Conversely, in his project a song is called "cited" when its attributes are incomplete. Those attributes are applied as follows:

- For All songs
 - Organize classification of Haitian mythological entities based on Fleurant's list. This is necessary for reliable index under which (song) data is to be harvested and or generated.
 - Provide comprehensive adequate and relevant search mechanisms
- For authenticated songs
 - Store the existing melody music scores in PDF format

- Store an audio file that facilitates listening to the melody
- Store the existing music scores of the rhythmic patterns in PDF format
- Store audio files of the rhythmic patterns
- Provide listening mechanism to site visitors
- Provide above PDFs for download
- Provide above audio files for download
- Provide submission tool for submission of new scores and incremental collection of PDFs and audios from external sources.
- Integrate the above objectives into an interactive web site
- For cited songs
 - Collect basic attributes required to cite a song from external sources
 - Collect lyrics and audio references if they exist from external sources
 - Promote cited or partially authenticated songs to authenticated songs.

The archive is available for everyone to read or acquire material. The curator functions are restricted to registered and approved contributors

Digital Archive Implementation

The web framework Django is used to implement the digital archive component of this project/ Django is based on the Python programming language using the Model View Template approach. The Model is the implementation of the relational data model that stores the preservation data; the Views implement the functionality; and the Templates are the necessary HTML for web browser presentation. The server configuration is depicted below and consists of:

- Django web development framework
- Posgresql database server
- Apache Web server

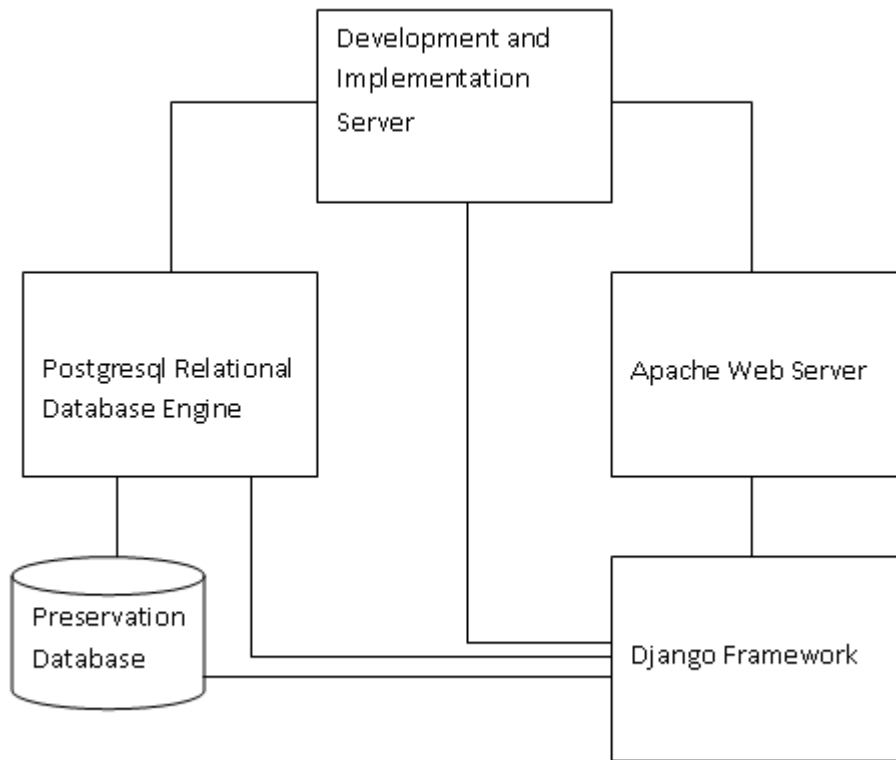


Figure 1: Sever Configuration

The Django framework is used on Apple MacOSX with a WSGI sever to build the web pages and structure navigation. This server is intended for basic client server web operations on a workstation but not suitable for web interaction. The WSGI server on the MacOSX machine is replaced with Apache web server that enables the functionality to play audio. The configuration of Apache is based on its proprietary directives that are contained in in configuration files that may reside in different directories flexible to address the needs of secured web services. Apache deployment has grown into a domain

of its own with dedicated practitioners. The Apache structure we use on MacOSX was not applicable to the target Red Hat based Linux server resulting in another round of configuration.

Django treats media file in a scheme that promotes one web server for web pages and another web server for Media files. This scheme accommodates complications that arise in large internet projects; it is very flexible and decouples the types of issues that arise in multimedia based internet dynamic processing. This sort of configuration is fairly standard in Django hosting environments catered to high volume traffic. This project was built using one web server.

The Django Templates

The website/application is comprised of:

- Administrative Component
- User Component

The administrative component is implemented via the Django Admin facility designed to reduce the HTML necessary to display relations of the relational data model. Through these mechanisms, the curator functions were implemented to differentiate between fully authenticated songs harvested and those that are unauthenticated. The user interface allows download of existing media while the upload functions are considered administrative to protect the integrity of the data. The upload function is treated as a system administration function to provide an extra layer of security at the operating system level using File Transfer Protocol (FTP); this can be changed using an appropriate Python package. I take this approach to constrain data collection for enhanced data integrity meaning that only trusted contributors can upload data. The cleaning of

unnecessary or invalid data is time consuming and carries implications proper to the Relational Database Management System such “orphanage” or broken data relationships. This approach also simplifies the design of the curator functions as well as the Python code and templates necessary to implement the design.

As stated earlier templates are HTML files with embedded Python directives. The interface is implemented with a base template that is used in all pages some of which are depicted in the navigation section and listed below

1. Index: The entry to the website and navigational root
2. About: Describes the intent and purposes of the web site
3. Contact: Relates to communicating with people interested in the project
4. Demo: Where outcome of applying media technologies can be auditioned
5. Entities: List of known Haitian Mythology entities of the Vodun religion
6. Production: Briefing on the approach of production
7. Renditions: Tool to track known renditions of Haitian Mythology music
8. Rites: List of the rites of the Vodun religion
9. Rhythm: List of rhythms, notation PDFs, audio clips, and download functionality
10. Songs: List of songs, Notation PDFs, Lyrics PDF, audio clips, and download function

Navigation

Navigation is implemented in the top section, left section, and right section that provides links from which functionality is deployed. Those three sections of the web pages remain visibly constant but the data change, contrast, and expand. This type of navigation is fairly common in web page dynamic processing. The index page is depicted below.

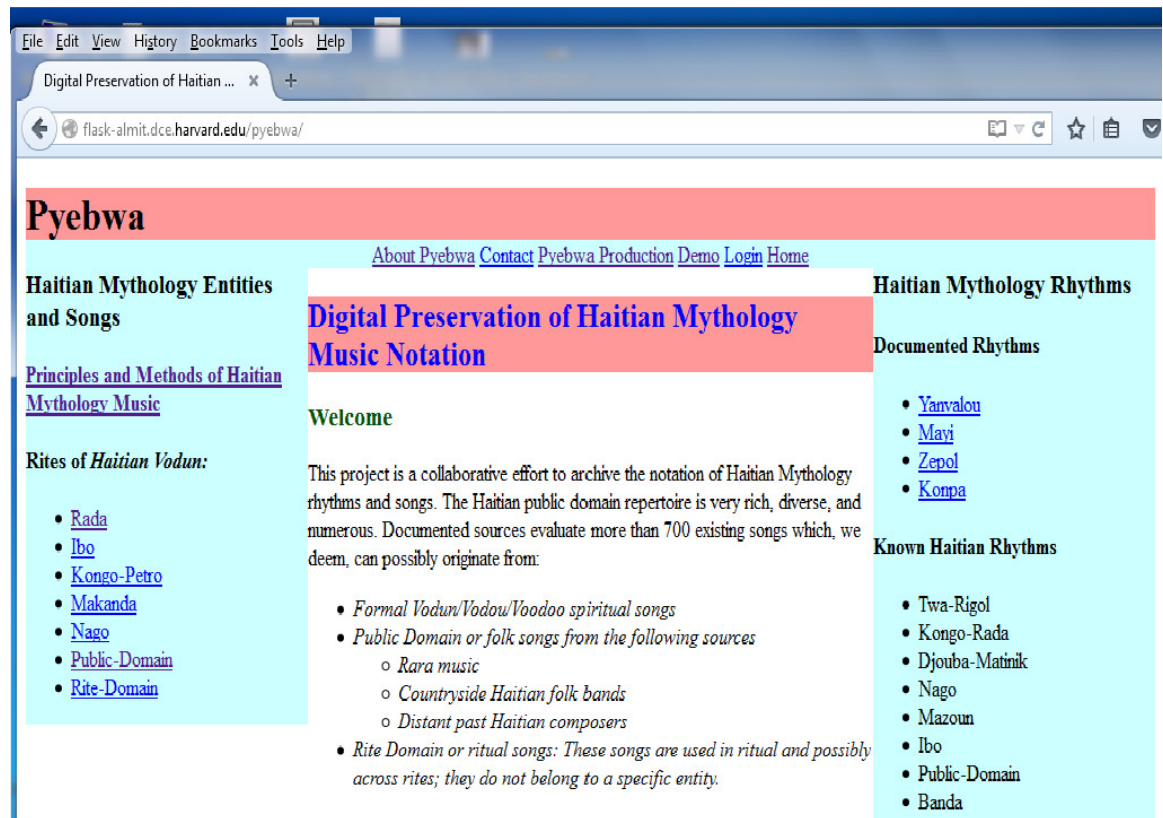


Figure 2: Index Page

This is the first page of the site with the three navigational areas described above. Upon entry, the top area facilitates navigation to support pages that are not related to the hierarchy of Haitian Mythology. The left area displays navigational links related to

melody of the songs and the right displays link related to rhythms. This maintains the separation of rhythms and melodies that we deem the Fleurant method.

The mythological hierarchy is also maintained. In order to normalize the hierarchical system that includes non ritual songs as well as cited songs, two fictional rites were added to the Haitian Mythology hierarchy and they are named Public-Domain and Rite-Domain. Rite-Domain songs are ritual songs that are not attributed to entities; they are used to mark events during rituals. The added rites simplify the algorithm necessary to identify the type of songs and reduce the amount of code to be written. This normalizes all songs to belong to a rite. Public domain songs share rhythms with ritual songs but are not attributed to rites and entities. Normalization in this case means the same algorithm is used for all songs via one word rather than additional code.

The list of links in the left pane in the above image represents the rites. If the link Rada is clicked on; the left side expands to show entities of the rite Rada below the list of rites links as depicted below

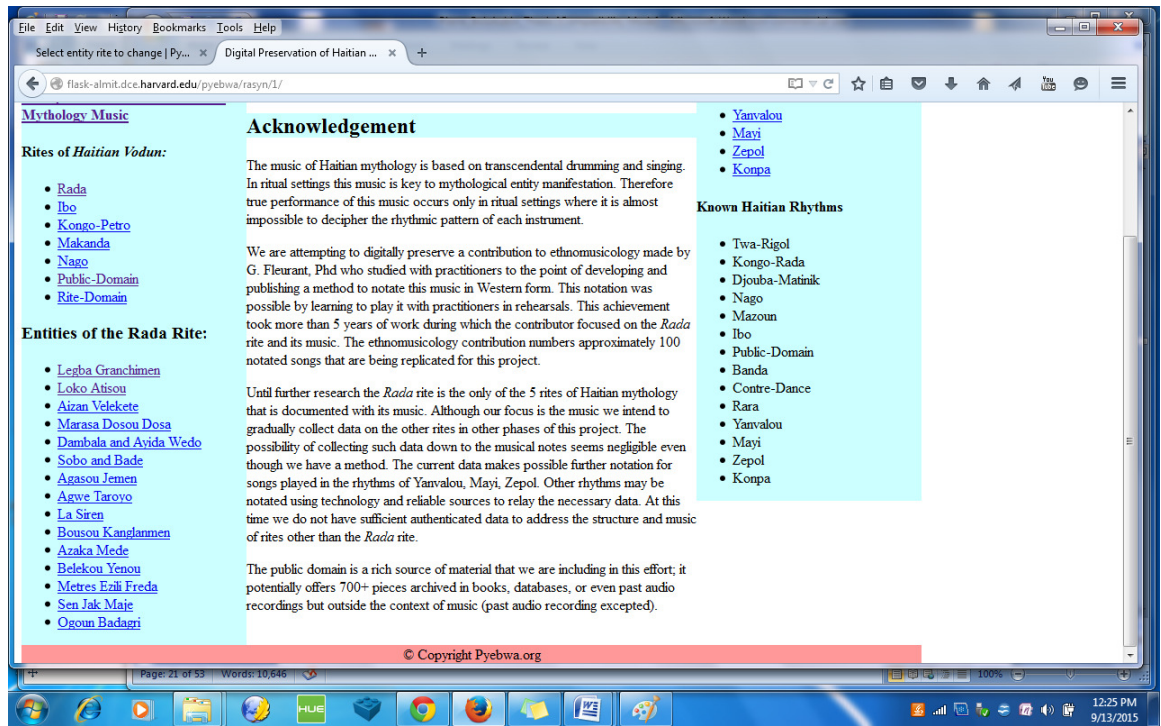


Figure 3: Screen with Extended Left Area

The above screen shows the screen with the left area extended to display the list of entities belonging to the Rada rite. The center area displays relevant information in this case it explains the work of Fleurant and the digital adaptation. When the entity name is clicked on it causes a display of the list of songs for that entity in the center area. When one of those songs is clicked on then the screen to listen to the melody and to download media is displayed in the center; the screen also branches to renditions of the songs. Both screens are shown below.

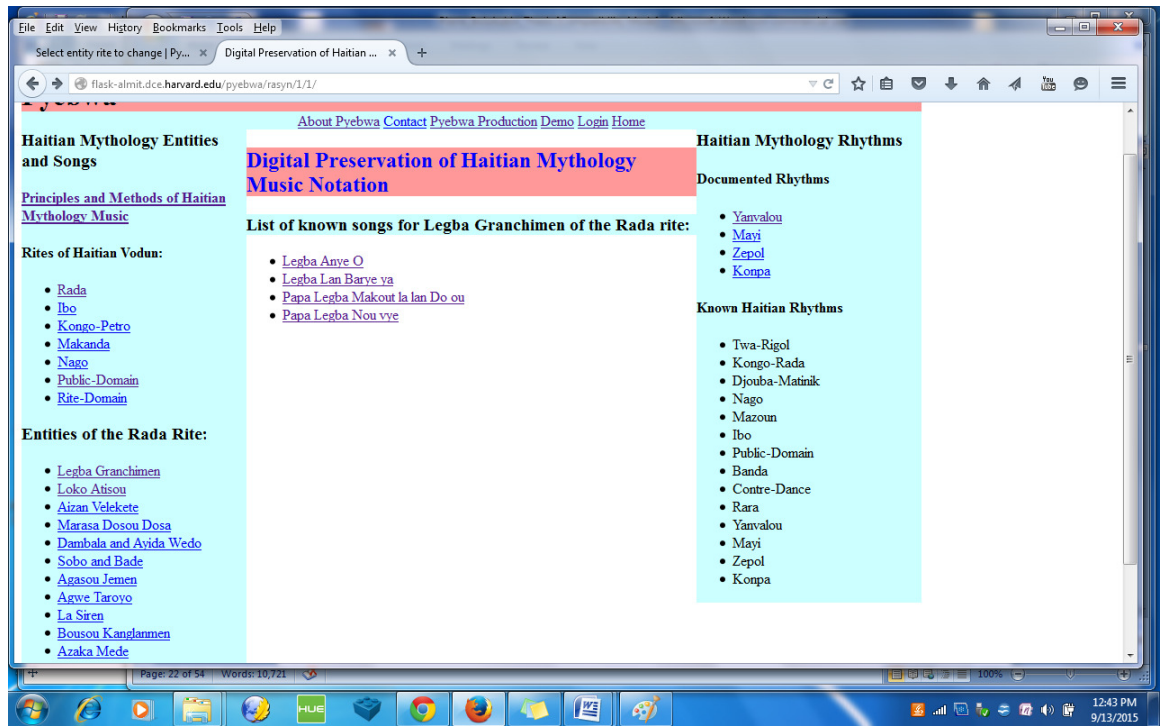


Figure 4: List of Songs for an Entity

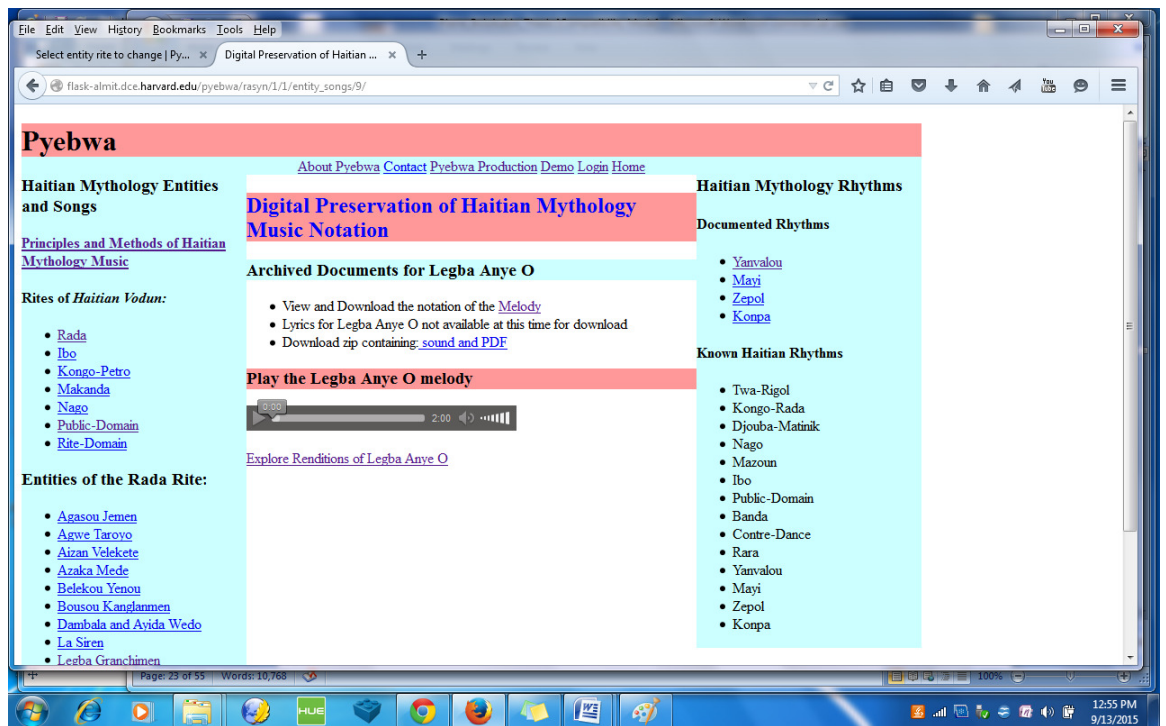


Figure 5: Song Page

Navigation of the separated rhythms works in the same manner as demonstrated for the rite, entities, song hierarchy. Rhythms are not hierarchical but they are known in terms of variations. Haitian Mythology music is based on 3 instruments of rhythmic consistency called the Ogan, Boula, and Segon. These instruments maintained a sequence of notes which is termed rhythmic pattern. In some cases instruments may be played in 3 different ways meaning rhythmic patterns. Each of these patterns modifies the rhythm; these resulting modifications are called rhythmic variations in this document. For example the rhythm Yanvalou can be played in four different ways based on single instrument rhythmic patterns as depicted below on a rhythm screen.

Although focus was placed in the autonomous aspect of melody and rhythm in the design phase and maintained in this prototype, relationship of rhythm and songs can be explored for useful features in the future.



Figure 6: Screen for Rhythms and Variations

In the above screen, the right area is expanded to show rhythmic variations of the rhythm called Yanvalou. Each variation is dealt with separately to reflect the rhythmic modification in the resulting generated audio and also the change that occurs in the rhythmic notation. Rhythmic notation are shown on multiple music staves depicted below

Yanvalou: Variation 1

The image displays musical notation for 'Yanvalou: Variation 1' across three staves. The top staff, labeled 'Bell/Ogan', features a sequence of notes with a long horizontal line above them, indicating a sustained or multi-measure rest. The middle staff, labeled 'Boula', shows a rhythmic pattern of eighth notes grouped into four sets of triplets, each marked with a '3' and a bracket. The bottom staff, labeled 'Segon', shows a rhythmic pattern of eighth notes, also grouped into four sets of triplets, each marked with a '3' and a bracket. A vertical bar line divides the notation into two measures.

Figure 7: Example of Rhythm Variation Notation

Chapter 3 Production Component

Music is traditionally preserved through performance and or production comprising of publication and. performance Published notation was a major part of music production revenue stream until the propagation of sound recording technologies. The production segment of this project is a virtual representation of traditional music production based on publication and performance.

Conceptual Music Production

For the purpose of virtual representation, music production is defined as the traditional music notation enhanced with media technologies that afford various manipulations to render complete orchestration in more than one form. Such orchestration is suitable for screening or use in hybrid performances.

The above definition may differ from the practices of digital music production in which technology is used to produce the current forms of “urban music” and outside the context herein although some of the technologies may overlap. The focus herein is on the two main components of traditional music production namely music notation and music performance. The notation component is the starting point of this work and it branches into various possibilities of music digital media. Audio engineering is an important part of this work but will not be focused on although its outcome is a determining factor when assessing automated notation compositions.

Music notation software is based on MIDI standard which is fairly general and MusicXML standard which is largely proprietary. Music media hardware integration and virtual musical instruments are based on MIDI. Software integration and virtual instruments use MusicXML in addition to MIDI. Both of these layers are transparently used in exploiting affordances through the system configuration of this project. The system configuration integrates a computer equipped with digital audio interface and the following software components:

1. Music Notation Software
2. Sound Sample Engine
3. Audio Processing Software
4. Audio Enhancing Software

The configuration was derived from the following objectives:

1. Replicate existing notation or create new ones
2. Generate minimal audio of the notation
3. Notate compositions for digital performance

The goals of this conceptual music production are:

1. Explore alternatives in arranging Haitian Mythology music
2. Assess fully arranged orchestration
3. Publish arrangements
4. Cooperation for hybrid performances
5. Explore audience possibilities

Music Notation Software

Music is produced via digital media in different ways that are unknown to this writer; so noted to acknowledge the diversity of digital music renditions that may not involve traditional music composition techniques. The presence of music notation implies adherence to traditional music composition. The basic understanding of MIDI recording forms the basis to the approach taken in this project. In MIDI recording a keyboard is attached to a software sequencer aka Digital Audio Workstation. MIDI recordings are often quantized to correct execution errors or they are used as is. This method is often used to create music parts that are used in loop. It can be used to record a whole song from beginning to end but is not flexible to edit. The motivation that seeds the workflow of this project is the flexibility of notation to edit. Prior experiments completed in collaboration reveal difficulties to control a composition from beginning to end. In those experiments, a standalone Digital Audio Workstation (DAW) was used for MIDI recording using MIDI keyboards and MIDI guitar. At some point the cost of acquiring MIDI drum pads caused my assessment toward more flexibility; I thought it was not a solution to editing.

MIDI is transparently used in this project because it is the foundation upon which notation software is designed and built. MIDI recording is possible through software notation and may or may not be quantized depending on the capabilities of the performer and other technical factors relating to the notation software. Quantization may render a notation unreadable and requires manual intervention to render legibility. In this project MIDI recording is not used to avoid unnecessary editing complications that concerns notation i.e. only traditional notation is used. The notation approach is fairly common in

the film and television industries and suits the prime objective of preservation better than MIDI recording.

Simple music notation software is one step above the printing press music notation because it offers limited playback that uses basic midi instruments. The more advanced software notation software, used in this project, contains those MIDI instruments but can also use sound sample in the form of virtual instruments at which point humanization enters. Humanization is a combination of performance parameters such as *expressivo*, *rubato*, and *rhythmic feel*; these affect the playback and multi track rendering; these parameters are proprietary MusicXML parameters meaning that they are unlikely to be transferrable like MIDI parameters. Music notation dynamics such as accents, *diminuendos*, *crescendos*, etc are used to further enhance the human feel together with 32nd and 64^{th rests} that are used to reflect such things as hesitations.

The notation software chosen for this project is Sibelius which comes with a sound sample library and a default Virtual Studio Technology (VST) component. Sibelius also has external plug-ins and other facilities that are based on the Rewire protocol that allows real-time interaction with other music media software on the same computer. The default sound sample is limited but other VSTs offering better samples can be used as engines; such engines further enhance the human feel. This project does not use rewire protocol features because the engine configuration consume much of the 8gb of memory.

Sound Sample Engine

So stated above Virtual Studio Technology (VST) is widely used in Digital analog Workstations. In this project we refer to VSTs as engines for clarity and to avoid the frequent error of referring to a VSTI as a VST. A VSTI is a Virtual Studio Technology

Instrument like a guitar that requires VST hosting. The choice of VST for the configuration of this project depends on what the notation software can integrate. Hence this project uses the VST called Aria and another called Kontakt which are supported by Sibelius. They are used alternatively because of the way this project is configured.

Sound sample libraries are organized by instrument categories and can be cumbersome in identifying an instrument. For example an electric bass category may have 15 basses of which one is to be selected for a particular arrangement. In order to find the desired one each sample must be loaded onto the engine for screening and then removed if unwanted. Engines (VSTs) are MIDI standard based and can only accommodate 16 channels and each instrument occupies a channel. This project is configured with 3 instances of engines which is the maximum that can be used based on considerable testing. One engine instance is used for percussion and wind instruments, another is used for keyboards and the last is used for strings. This works well in identifying instruments from sample libraries without the side effect of destroying instruments assignments to MIDI channels when screening instruments from the library. It should be noted that consistency in MIDI channel assignments alleviates configuration problems because one configuration is applied to all compositions.

With these engines configured properly into the notation software, stereo playback can use these samples and a plug-in is used to produce multi track based on each notation staff that represents one instrument. This as stated does not apply to drums and percussions that this project uses intensely due to the nature of the music. A drum set is written on 5 tracks/staves other percussion usually takes 2 channels. The 3 engines is limited to 48 tracks but the default sample library is unlimited and can be used

additionally but produces a side effect in sound sample compatibility. The sound quality of the default sample library scores poorly in multi track mixing but very good in rendering dynamics and performance parameters. These samples require extensive and careful audio engineering treatment to bring them to compatibility with those samples that run on the aforementioned engine instances.

Audio Processing Software

The playback mechanism of the notation software is complemented with an elementary mixer that outputs a stereo track. This is sufficient for preliminary screening of arrangements but can lead to false assessment due to amplification. Sound enhancing software is applied to the stereo track in this case the software Audacity is used for such. Generally, sound samples yield weaker multi track signal than real instruments. They tend to sound disappointingly muddy and lack liveliness. This is enhanced with a Digital Audio Workstation (DAW) to process the audio. There are many DAWs commercially available; the one called ProTools seems most popular in professional studio settings and is the one used for this project for sound sample based arrangements. Protools focuses on sound engineering without the complications that are proper to popular digital music which it is also capable of.

In order to process the instruments/samples of the notation software, audio tracks are generated per instrument/track. These audio tracks are similar to recorded studio sound tracks. Based on experience, the feel of an arrangement differs between the stereo sound output of the notation software and those generated for the DAW. By the time an arrangement is heard on a DAW, its swing factor is degenerated i.e. it loses some of the humanizing attributes discussed in the notation software section. Most of the deficiency

is in performance parameters and this may be caused by playback engine mechanisms that are bypassed when audio is generated or the DAW engine modifies the original feel; MIDI parameters remain satisfactory. This means that the stereo track from the notation software yields a different feel than the stereo track rendered by the DAW. This remains the most complicated aspect of music production beyond the conceptual and also the reason that I deem, up to this time, such output is suitable for hybrid performances. The DAW, in this case Protools, is used for mixing audio to brighten the muddy sound of the instrument samples mentioned earlier. Further experimentation is possible toward normalizing the output of multi tracks to maintain human feel in multi track

Since the intent of the conceptual music production is for hybrid performances and recording, then another DAW is used for that purpose it is called Live 8. It is a DAW for stage performances which focuses on sequencing and default proprietary electronic virtual instruments. This DAW is used in this project to set up hybrid bands. In experiments toward this end the same multi track from the notation software are imported into Live 8. Then Live 8 is used to route the tracks into amplifiers in such a way that musicians can be substituted with pre recorded audio or digital instruments that are enabled by exporting the MIDI equivalent of an audio track from the notation software. In other words Live 8 is also used for rearrangement of an orchestration by changing instruments. Each audio channel can be routed to an amplifier via 8 stereo channels for stage or recording performances. The current configuration for hybrid performance from Live 8 is currently limited to 8 instruments occupying the 16 channels; other configurations may be possible. The channel limitation is a hardware issue that is irrelevant to the Live 8 software.

Characteristics of the Conceptual Digital Media Music Production

The conceptual production component of this project is the most challenging because of the convergence of technical side effects as well as human parameters that concern performance and audience. The human parameters can be summarized in terms of genre and targeted audience that are undefined. Producing unclassified music for an unidentified audience is an unintended consequence of conceptual production that greatly influences potential participants. At this point experiments occur at the technology level and also at the music transformation level.

At this stage, the expectations of technology are fairly well established and tested but the human domain remains largely untouched although necessary. Electronic based music is known for certain limitations and the most common is the difficulty of making changes to compositions that are in final stages.

This limitation is greatly alleviated in the configuration of this project but requires an approach different to common practices. Music is the product of cooperation among musicians and fruitful cooperation largely depends on understanding as a result of communication mainly through the music language. The layer of technology adds another layer of communication/comprehension that may require time to assimilate. This understanding is necessary for a participant to develop an approach for successful participation. Although software based music production is the norm at this time, the integration of notation in the production workflow remains fairly unknown even though such arrangements are much more flexible; eliminate a lot of constraints; allow musicians full control of composition from beginning to end. Based on experience, collaboration seems best approached from common practices that are familiar to potential participants.

An arrangement or composition exists in many states simultaneously in this conceptual production and changes can be propagated throughout the states. The most rigid change is a tempo change that affects a whole composition. The basis of the conceptual production is the notation which seems to yield the most satisfactory result in terms of objectives. The satisfactory result is that most often test subjects assess that the music being heard is performed. This leads to comments that are targeted to the music which is useful in determining what is or is not suitable for specific audiences. Such assessment is done by trying to match composition to a subject's musical taste.

From notation there are two types of product possibilities, one is acoustic flavored and the other is electronic flavored each rendered through the DAWs discussed in the previous sections. Once the length of the arrangement from beginning to end is settled in the notation software then the audio mixing process can be initiated and from this point on changes made can be incorporated in the mixes. Instruments may be added, changed, or deleted; notation can be changed and integrated in the mix. Tempo change as well as length change destroys the mixing state, meaning that the mix state must be reinitiated.

In this conceptual production music composition and sound engineering are integrated and they progress in parallel toward the final composition outcome. In common practices the arrangement precedes the sound mixing or the sound mixing is the arrangement in the case of Live 8 that is designed to also accommodate DJ music making.

Of the two states in which an arrangement can exist the acoustic flavored is audio generated using sound sample Virtual Studio Technology Instruments. The acoustic

flavored arrangement translates to sound engineering and can be processed by both DAWs although ProTools is the preferred choice in this project. The digital state arrangement is a combination of audio tracks and midi tracks of the audio tracks. This combination extends the arrangement to digital media artistry because now what was a saxophone can become a bass and whole lot more is possible with the use of other features that are proper to the Live 8 DAW.

The conceptual production is far from the realities of today's digital culture, it is a good starting point that indicates characteristics to be addressed and adjustments to be made.

Chapter 4 Haitian Mythology Music and Afro Western Music

Throughout history people of African descent have been identified by different names. In Europe Africans were called Moore up to a certain historical period. The current name in the United States is Afro American that replaces the term black American. Afro American does not mean all African descendants living on the American continent hence insufficient for multinational reference. For example, Sonny Rollins is known to be a West Indian descendant and the Cuban Bassist Israel "Cachao" López made contributions such as

He [Cachao] is celebrated as the inventor of the mambo rhythm and a salsa pioneer while his transformation of the bass into Cuban music's lead instrument would inspire much black American jazz, soul and funk³.

In certain circles, Cachao is credited for the melodic bass line of the genre Funk. He illustrates the multinational aspect although he is not Afro Cuban but Mongo Santamaria is Afro Cuban and made contributions including his composition "Afro Blue." The term Afro American lacks "emphasis of the underlying African unity for all areas of black culture in the Western world"(Fleurant, 1996). Hence, the term Afro Western music is used herein to generalize this underlying unity of all African descendants as reflected in the evolution of music in the Western World. The term also implies the global genres (Blues, Funk, Jazz, et al) that originated from Congo Square, New Orleans where "Voodoo rhythm" has been in the music evolution from 1791.

³ Garth Cartwright, (2008), Cuban bassist, he and his brother invented the mambo rhythm, The Guardian, online edition March 23 2008, <http://www.theguardian.com/music/2008/mar/24/obituaries.cuba>

There exists a relationship between Haitian Mythology music and Afro Western music that dates back to 1791. The 1791 emancipation that gave birth to the country of Haiti free of colonial rule caused an exodus of “Free Gens de Couleurs” or Creoles from Haiti to New Orleans that doubled the New Orleans population between 1791 and 1811. These Creoles as their descendants are still called today congregated with New Orleans slaves in Congo Square on Sunday afternoons where they primarily play music and dance; this tradition is ongoing in New Orleans. New Orleans based Afro Western music is acknowledged to be rooted from these Creoles in Congo Square who brought with them various rhythms and music from Haiti. The Afro Western genres, Cajun, Funk, Jazz, and Zydeco are said to be rooted in the Congo Square gatherings.

These Creoles established entertainment businesses that spurred the New Orleans culture from which Jazz evolved. Of the first Creole generation was Louis Moreau Gottschalk (1829-1869) was “born to an English-Jewish father and a Haitian mother.”⁴ His mother was pianist and he went on to become a classical pianist who transformed the rhythms of Congo Square in Classical piano pieces. Jelly Roll Morton (1890–1941) was also a Creole and one of the first Jazz composers. Gottschalk and Morton are pictured below.

The period of Jazz evolution in which the transformation of Congo Square music toward Afro Western music occurred is largely un-documented but traces seem to persist in oral tradition. One example of such is the lyrics in Louis Armstrong rendition of “Jazz was born” based on a composition by “A Song was Born” by Don Raye - Gene De-Paul.

⁴ <http://press.princeton.edu/titles/8142.html> as of September 2015

“They took a great jungle beat
Brought it to Mason St
That’s how jazz was born
And then someone played a wail
All up and down the scale
And that’s how jazz was born

They simply played what they liked
As long as it would fit
If it just had a beat that was it

And then a horn came a scream
They took it as a theme
And that’s how jazz was born”



Figure 8 Louis Moreau Gottschalk



Figure 9 Jelly Roll Morton

The relationship of Jazz with Haitian Mythology music is currently being deciphered by New Orleans historians. This relationship is of interest in this project as one of the objectives is to arrange Haitian Mythology music in Afro Western format. This intentional fusion of Afro Western Funk/Jazz toward a derived musical form implies the “need for fluency in two musical cultures and to learn to perform the new music one is studying” (Fleurant, 1994). My study of the two musical cultures is rooted in known principles attributed to African music inherited by Haitian Mythology music; a subset of these principles applies to Jazz as well. These principles are compiled by Fleurant (1994) and presented below:

1. Predominance of poly-meter and polyrhythm 3 against 2 beats rhythmic patterns: not currently applied in mainstream Jazz.
2. Off beat phrasing: is at the core of Jazz
3. Format containing antiphonal, call and response, polyphonic, and binary AB form: not applied in mainstream Jazz

4. Learned time keeping using the bell as guide: applied to jazz as the ride cymbal although not “learned tempo” because Jazz performers learn time/tempo from the use of the metronome as an integral part of Western music training
5. Collective participation and improvisation: is at the core of Jazz
6. Drum chorus using 3 drums: not fully applied to mainstream jazz played with a drum set.
7. Press/bounce technique of sound reproduction and talking instruments: not applied in mainstream Jazz but used sparingly in drum solos.

Understanding the intersection of these principles with Jazz is a step toward the musical arrangement of Haitian Mythology music based on Afro Western techniques through abstraction. On the one hand, the resulting music of early recordings of Jelly Roll Morton has no apparent trace of Haitian Mythology music mainly because the drum based music from Congo Square was transformed with the piano. On the other hand Haitian cosmopolitan music, generally, has no trace of Afro Western music primarily because of European music imitation and a detachment from rural Haiti where Haitian Mythology music remains. This convergence is touched on in the following synthesis with added emphasis

“Using his Cantometrics system, Lomax (1975) concludes, ‘The folk song style of Haiti [is] a **conservative member of the Afro-American style tradition**. The main Haitian **rural song performance patterns** are, first African, and second, West Indian.’” Lomax reaffirms Herkovits’ (1971) emphasis on the underlying African unity for all areas of black culture in the Western world. Referring to the scores of studies that “show the survival, the retentions of African cultural patterns in varying degrees of intensity in New World culture,” **Lomax refutes the contention that New World music is significantly influenced by Western European folk tradition**” Fleurant (1996)

Historically, Haitian cosmopolitan music is known to be influenced by European music that seems incompatible with Haitian Mythology music in rural Haiti. The

incompatibility of this influence leads to poor musical tradition that has been known and addressed throughout history and one such criticism from 1919 is exemplified by

Grenier, Robert (2001) in the following:

A 43-page essay published in Port-au-Prince in 1919 by Dr. Franck Lassegue (1892-1940), entitled "Etudes critiques sur la musiques haitienne" (A Critical Study on Haitian Music). (2) Lassegue surveys the state of Haiti's musical culture by presenting a general overview followed by a critique of four contemporary composers: Ludovic Lamothe (1882-1953), Justin Elie (1883-1931), Alain Clerie (1876-1941), and Nicolas Geffrard (1871-1930). The general theme of this essay is a search for a distinctly Haitian "voice" among, what the author contends to be, the "domination" of European musical models. For example, in speaking of Nicolas Geffrard, the composer of Haiti's national anthem, La Dessalinienne, Lassegue (1919, 41) makes the following observation:

As he has constantly absorbed Mendelssohn and grown strong thereby, I have found in la Dessalinienne a bit of this warm and enthusiastic music which we occasionally encounter in the author of the A Midsummer Night's Dream. However, Mr. Geffrard told me that he found his inspiration in a score by Schumann to ground his laconic drama where one hears moaning those cries of revolt of an undefined nostalgia. ...

Music education and past production play a significant role in the absence of evolution of Haitian Mythology music. In addressing these causes, I am taking an approach using technology to complement for these causes using the theory that Haitian Mythology music has similarities in principles with Afro Western music that evolved from New Orleans.

The resulting music, into which I apply the above principles using songs of the existing repertoire results in a transformation with authenticity. Given the extend of the rich repertoire and the number of rhythms involved, it is difficult at this time to pinpoint a specific style as each rhythm yields a style.

In approaching ritual music, the AB (binary form) is transformed into ABA (part A, part B, part A). By keeping the rhythms and melodies in native form, integrating the

drum set to emphasize rhythmic pulses, and using melodic background on rhythm, a new music is derived. This new music retains the “Predominance of poly-meter and polyrhythm 3 against 2 beats rhythmic patterns” in cosmopolitan Afro Western format. Although ritual music is dance music, the dancing aspect, in my arrangements, is nullified in preference of emphasis on melody. The dancing to 3 against 2 beats rhythmic patterns music is, in my view, suitable for ritual and theatric, however the music is suitable for listening. This approach yields encouraging transformation aimed at listening.

Excluding Rara, my experiments with the folkloric songs using the above method do not yield appreciable transformation because: 1- the Afro Western metronomic approach modifies the swing of the music and its dancing character, 2- the application of rhythmic pulse or back beat induces rigidity in contrast to the playful allure of the music.

Rara is a type of music in Haitian Mythology that may or may not be affiliated with the Vodun religion. Traditionally, Rara period follows the Mardi gras period from Ash Wednesday to Easter Sunday, but informally it is played throughout the year. Rara is performed with varying instrumentation but the bamboo (bambou) is central. In my experience of applying the above methods, Rara yields the best result due to its flexible dance rhythm; it has transformation potential in Afro Western cosmopolitan music. However this music’s repertoire is probably the hardest to catalog, if at all possible.

Given the historical relationship of Haitian Mythology music to Afro Western music the techniques I apply seem natural. They are not used in the native form because:

1. drums and voices are the primary instrument in rural Haiti
2. lack of Western musical training
3. detachment from the evolution of Afro Western music

Much of the evolution of Afro Western music can be attributed to musical training using Western instrument. In rural Haiti a bass instrument is similar to a thumb piano. This instrument is limited in pitch and is played in 2 notes rhythmic pattern that becomes the time keeper in folkloric music; ritual music only uses drums and voices and a bell as time keeper. These differences are taken into consideration when applying the following Afro Western techniques for composition/arrangement.

- Metronomic time rather than learned tempo: default with notation software. This introduces a rigidity that sounds unusual to the music.
- Redistribution of rhythmic in instruments: Necessary to integrate the drum set as a new instrument with more possibilities as well as melodic instruments playing parts of the rhythm.
- Intentional triplet feel when applicable
- Rhythmic pulse or back beat to facilitate the drum set integration
- Bass line groove: The bass plays a rhythmic melody
- Rhythmic melodies of chord changes as background

The resulting music to which the above techniques are applied is experimental and needs to be performed for further learning and adjustments; hence hybrid performance is the next step.

Chapter 5 Summary and Conclusions

The choice of computer language to implement the archive component of this project was based on simplifying the software necessary components. The python language was selected because of its consistency in data structure from server to the client browser. This consistency significantly reduces the code to implement when compared to other candidate languages. Originally the Python based framework named Flask was selected for the flexibility of customizing the framework configuration. Due to version conflicts of Python packages it was difficult to add packages in the configuration, Flask was replaced with the Django framework. Some conflicts were at the Operating systems level, others at the level of Python version

One of the benefits gained by switching framework is the Django Admin facility that simplifies the "Create, Read, Update, Delete" paradigm also known as CRUD that the archive of this project can be classified as. The Django Admin facility provides a comprehensive user management component that was modified to provide basic curator functions defined in the initial design. Modifications are well accommodated in Django Admin through the ability to execute customized python code.

The curator functionality would be significantly affected if discovered material was to be included in the archive. The Django Admin component would play a significant role toward implementing such inclusion. The enhancement of the curator function was mentioned in chapter 1 and some cases were discovered upon which the following generalities are drawn

1. Notations of songs were published before the audio recording era
2. Songs may exist only in audio format including voice only
3. Songs may only have lyrics without melody as seen in publications
4. Songs may have Melody without lyrics and exist in audio form

The interest in Fleurant's work stimulated the interest in digital preservation mainly because it addresses the application of rhythm with a general description of the mechanism that can be used to understand and notate other rhythms; Fleurant offers notation for three rhythms and there exists more than 15. The relationship of rhythms to songs was established on Fleurant's publications however in digital archive much more is possible when usability is considered. Haitian Mythology songs are found in other works to signal the possibility of a complete digital reference. The approach for a complete digital reference has nuances in objectives. The works discovered are listed below; usability determination is a starting point to identify further objectives.

1. Songs were notated by L. M. Gottschalk circa 1840
2. A song book by Clara Gottschalk Peterson in 1902
3. Some songs were found in Dorothy Scarborough's 1925 work
4. The 1936 Alan Lomax audio recordings already are preserved by production. Is there any usability or other benefits in digital archive reference?
5. The Work of Max Beauvoir exists in book form and computer files on the Vodou Archives cited in chapter1. Does usability of the material justifies digital archive referencing?

6. The Vodou archive contains songs from various sources as a subset of its data. Can digital referencing enhance the usability of the song subset? Can reference be based on link of current data locations that can change?
7. Other works found in various citations

As part of the conception phase an objective was set to extend this archive beyond Fleurant's work and accommodate known and unknown works. The current implementation satisfies the initial objectives but will need to be revised in order to accommodate discovered scenarios. Appropriate curator mechanisms and a revision of the usage of rhythm data are two areas that are likely to be impacted in approaching expansion. Usability should define the scope and requirements for expansion.

The music production concept workflow draws on the understanding of two specialized disciplines namely music and audio engineering. Therefore much of the research done in completing this project dealt with understanding those realms through experimentation. The understanding of those realms implies the development of skills through usage and even training that partially contradicts the assessment that technology can play a major role in addressing the lack of education and music production. These shortcomings originate in the human domain because ability and willingness play a significant role toward the remedy purported in this project. Hence the human domain is a considerable factor.

I approach human domain from the revelation that Fleurant's publications are mostly unknown to the Haitian musician community. This is a signal that the motivation to explore Haitian Mythology music is unsurprisingly puny. Historical practices seem to normalize the abandonment of this music in said community. The view of this writer is

that the application of technologies to preserve the music cannot stimulate motivation even when the affordances point to possibilities that were beyond reach; this also applies to affordances of Fleurant's work or any similar work. We acknowledge the following items, in considering motivation, that also reflect on persistent historical practices:

- 1- Identify a sector of the Haitian musician community that is receptive to Afro Western music
- 2- Disseminate the historical significance of Haitian Mythology in Afro Western music evolution
- 3- Encourage rudimentary learning of Western music necessary to comprehend the structure of Afro Western music techniques for transforming native music using available technologies and the existing vast repertoire of Haitian Mythology music.
- 4- Emphasize the value of the Haitian Mythology music repertoire and its significance and potential in Afro Western music evolution
- 5- Promote existing works such as those of Fleurant as sources for understanding Haitian Mythology music structure for application in orchestration work while encouraging the use of technology to complement the weak cosmopolitan music tradition that ensues from historical antecedents.
- 6- Consider current common usage of technologies to approach the above.

My experiments with music media technologies yield encouraging results. Based on these results I conclude that there is great potential for music media technologies as tools to alleviate the effects of a lack of education and music production of Haitian

Mythology music. However, the cross discipline characteristic of these tools is analogous to the understanding that Word Processors do not make good writers.

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