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"Musical Editions: The Past, Present, and Future"

This capstone project is the result of a collaborative research grant that was completed in the summer of 2014, the experience of which has led to the development of ideas around how to enhance scholarly musical critical editions with the use of technology. This paper will discuss the development of early critical editions as well as the innovations and progress that have taken place in more recent editions of the past ten years. This capstone will also detail the developments that have taken place with the Gershwin Initiative, and will culminate with a proposal for software that will enable new editions to become more useful and more used by a greater range of musicians. The background that will be provided about traditional editions, as well as recent developments, will serve as a foundation for the efforts to envision a digital edition that can improve on the status quo of the musical edition.

The point of proposing a new format for editions is to provide editors with the ability to address some of the current issues with the creation and adaptation of a critical edition. Namely, this new format will allow editors to create a more dynamic representation of a given musical work, rather than focusing on the creation of a single static representation. This shift is proposed in order to help editions reflect a mode of thinking about music that is centered on the exploration of how musical works change throughout time, rather than remaining constant and unchanging. A central component of this project is to examine the relationship between format, content, and editorial decisions. During the period in which the *Bach-Gesellschaft-Ausgabe* was compiled (1850-1901), a collection of a number of large textbooks that provided an

unprecedented repository of an incredibly influential composer's body of work was considered innovative—or "state-of-the-art," to use a modern term.[1] This is no longer the case.

In order to facilitate a discussion of how to leverage current technology to push scholarly musical editions into the future, we must first examine the history of musical editions. I will discuss the broad categories that editions fall into, the process behind the creation of an edition, and what it means for a composers' work to be collected in an edition. This section will enable a discussion centered on how to improve editions later on in the capstone.

The following quotation, taken from the Grove Dictionary of Music, highlights an important facet of the edition, which is that critical editions need to in some way represent not only the work, but the influence of performance practice: [2]

> A historical edition may be generally defined as one devoted to a body of work of the past; a critical edition is one based on scholarly evaluation and collation of sources, taking into account variant readings and innumerable aspects of contemporary performance practice (Dean).

There are three broad categories that differentiate editions. First, there are scholarly editions, which are also known as critical editions. The goal of a critical edition is to present an authentic musical text. These editions seek to reconcile the difference between all available primary and secondary source materials, with a high degree of editorial involvement. A second category of editions are performing or practical editions, which are designed to be used by performers. They are generally less exhaustive than critical editions, as they are intended primarily for use in performance. Ideally, these editions differentiate between editorial markings

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[1] The Bach-Gesellschaft-Ausgabe was one of the first editions ever created, and will be discussed in a later section of this paper.

[2] The Grove Dictionary is among one of the first sources examined by undergraduate music students, particularly at CC.

and original markings from the composer. The last category are facsimile editions, which are photographic copies of the original source documents (Gottlieb, 200-202.)

An incredible amount of work goes into the preparation of an edition. Before the process can begin, the source material for each musical work must be identified and verified. Falsified manuscripts must be excluded, and occasionally certain source material must be excluded as well.[3] After the authentic source materials are identified, they must be analyzed and compared to each other. Generally, there is more than one source document. There must then be a standardized set of editorial practices that determine which elements from each particular manuscript become represented in the final work. Editions in-progress are subjected to painstaking scrutiny, and go through countless versions until each individual note, accent, expressive text, dynamic, and any other inclusion has been checked against each manuscript.

Generally speaking, a composer is ascribed worth by the existence of a critical edition in their honor. The creation of an edition is dependent on a very substantial amount of work by a wide range of academics. Editions take many years to complete, so any undertaking to compile all of a composer's work is implicitly valuing the worth of a composer. Many of the composers deemed most significant within the western tradition have their own editions. Certain composers such as Bach, Mozart, and Beethoven even have multiple editions of their work dating back hundreds of years, with new editions coming even in the last twenty years.

The *Bach-Gesselschaft-Ausgabe* (BGA), published by Breitkopf & Härtel, was founded in 1850 by a group of highly prominent professors and musicians. The editorial board included some influential composers and performers, notably Robert Schumann and Franz Liszt (David,

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[3] One instance of material that originated from the composer that is excluded is in Kurt Weill's edition. Weill's unfinished and fragmentary works, and works finished by others are excluded from the Weill edition.

Mendel, Wolff, 504). Wilhelm Rust served as the chief editor from 1853 until his death in 1898. The volumes of the BGA that were authored by Rust are known for being of high quality, but other volumes contained within the collection are of varying quality. Rust authored twenty six of the forty six volumes that compose the BGA. Rust "set the exemplary philological standards that provided a model for virtually all musicological editions to come (David, Mendel, Wolff, 504.) The total number of pieces contained within the BGA numbers 599 individual compositions.[4]

Having a collection of a given composers' work organized in a clear and logically sound manner is an incredibly useful tool. It provides a comprehensive and (hopefully) well organized repository for the entirety of a composer's creations. Works are generally separated in terms of genre. The forty-six volumes that comprise the BGA are not, however, organized in a coherent manner. The first two volumes are all church cantatas. The third volume is a collection of keyboard works, which is then followed by a volume dedicated to the *St. Matthew Passion.* Following the *Passion* is another volume containing more church cantatas, as well as the *Christmas Oratorio.* Then comes the *Mass in B minor*, which is so massive that it spans an entire volume, followed by more church cantatas.

One of the central issues of traditional critical editions has to do with language. The standard practice for critical reports and introductory essays that accompany a given edition is to write in the native language of the composer, most often German. This means that it is very hard for the average English speaking musician to garner much use out of the reports that accompany any given critical edition. Such reports are generally reflective upon the process of creating the

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[4] This number was generated from a piece of code that I wrote analyzing the number of individual works as indicated within the text index of the BGA on IMSLP. Not all of the works contained within the BGA were authored by Bach, with some contributions from Vivaldi. A work such as Inventionen that contains a number of pieces is counted once.

edition and the editorial choices that were made. English translations of early scholarly editions such as the BGA are not readily available. This presented some issues during the research section of this capstone, but the result is ultimately the same: as an English speaking undergraduate level musician, I was unable to garner any useful information into the editorial process that went into creating these works. Not being able to read the introductory essays is particularly detrimental to the understanding of the importance of the process behind the compilation of an edition. Any new insight into the musical work that came about through the authoring of an edition is lost on readers who cannot understand the introduction. The compelling details of how an authoritative version of a composition came to be are completely lost. This is magnified by the lack of sources that take an analytical approach to the methods used in traditional editions. For example, one insight that emerged through the process of creating an edition of *Rhapsody in Blue* was the existence of an ending that was different from much of the existing material (recordings, performance practice). For a non-English speaking musician, insights into this new ending would be completely lost in translation.

The ultimate aim of this Capstone paper is to examine ways in which technology can be leveraged to create a better critical edition, particularly with respect to the future of the Gershwin edition as its production gets underway. But what does "better" even mean? How can we improve upon extant formats for editions? In order to provide a basis for comparison, and to get some general context, a discussion of present critical editions will follow. I will analyze what modern (within the last 10 years) critical editions look like. Relevant areas for analysis include music notation, formatting, how commentary is included, and other elements that the editors have chosen to incorporate to create a more immersive experience.

A number of editions have been published online in recent years. Notable examples include *Carl Philipp Emanuel Bach: The Complete Works* and the *Neue Mozart Ausgabe: Digitized Version*. The C.P.E. Bach edition and the *Digital Mozart Edition* (NMA) are very similar in a number of ways including content delivery and format. Accordingly, a detailed discussion of the C.P.E. Bach edition will follow in lieu of an analysis of both texts. I will analyze and evaluate the editorial decisions that lead to the digital version of C.P.E. Bach. Certain other texts including the 2006 publication of *Tchaikovsky Thematic & Bibliographical Catalogue of Works* and the 2014 edition of the Cole Porter musical *Kiss Me, Kate* were considered for analysis, but are not included in this capstone as other examples discussed herein display more noteworthy recent innovations. One beautiful facsimile edition that is analyzed was released by Disney this year.

Snow White and the Seven Dwarfs is significant for being the first full-length animated film, created by Walt Disney Productions in 1937. *Snow White* was a gamble for Disney, as it was the first film of its kind to be made by Disney, or anyone else. Its success prompted the creation of many other animated films by Disney. In 2015, Disney created a historical edition of the score for *Snow White*. In much the same way that composers are canonized into the history of music with editions, Disney has sought to canonize *Snow White*. This is a valid effort by Disney. *Snow White* was groundbreaking, and deserves its spot as the first animated musical film.

This work begins with a prologue detailing the conditions in which early Disney works were created. More specifically, it details the novel process that was invented in order to incorporate music along with the animation. After the brief prologue that provides some context on the conditions of the Disney studio at the time of the creation of *Snow White*, there are high quality images of the master score for the film. Interspersed between the score are images from

Snow White. The epilogue describes the efforts by the Disney Music Legacy Libraries (MLL) to catalogue and archive the large body of work created by Disney from 1923 onwards. "Each individual item is precision scanned, catalogued with all relevant information, tagged with unique metadata, and uploaded to the company's secure internal repository, Disney Documents Online (DDO)" (*Snow White,* 206). Beyond this smaller edition, the descriptions of the efforts by Disney to create this repository lead me to believe that Disney is working on a project of much larger scope than this *Snow White* edition.

Disney has attempted to improve their facsimile edition by incorporating some novel design elements that help distinguish it from other editions. The images from *Snow White* help provide context and immersion to the overall edition. The fact that the reproduction of the manuscript is so high quality conveys something more than a transcribed version would. Disney wanted to create a more immersive experience for their edition of *Snow White*. The images of the manuscript are given a faux shadow, with outlines carefully created to reflect the variations in the individual pages of the manuscript. The images have been heavily edited to create a high quality representation of the page. The images on the page are digitally scanned in the process described in the epilogue; essentially Disney is methodically scanning in their entire collection and adding metadata. Binding either side of the pages edition are sketches of the various characters from *Snow White*. There are no annotations or insights present by editors outside of the prologue and epilogue. The pages feel authentic, not sanitized because you get to see a lot of character in the music.

This facsimile text would not be of much use to someone trying to perform, however. An edited and minimally annotated version of the work would be much easier to perform form. One of the drawbacks of an edition such as this would be a lack of a multitude of uses. The work is

very interesting, and the raw pages of the manuscript do provide insight into certain aspects of the character of the musical work, but the gain of these minimal insights is countered fairly significantly by the lack of actual utilitarian use for performance. This is one avenue that a digital edition would have an advantage over an edition such as this facsimile score.

The *Snow White* edition is an example of a scholarly musical edition that is privately funded. Disney is notorious about retaining their intellectual property, so it is no surprise that they handled the production of this edition in-house. This is indicative about a change that is currently occurring in the world of editions. The recent *C.P.E. Bach* edition is another example of a privately funded undertaking, albeit one of a much larger scope and size. *The Gershwin Initiative* is currently seeking external funding, as it is projected to be "a 20+ year research, learning and publishing project." (University of Michigan, 2014)

The late-Baroque composer Carl Philipp Emanuel Bach is having his work canonized by the creation of a new edition from the Packard Humanities Institute. One author who reviewed the edition stated that C.P.E. Bach "is the most important composer of the past 400 years whose complete works have not yet been published in a scholarly critical edition" (Corneilson, 28). The recent edition of C.P.E. Bach among other prestigious institutions is an early example of a digitized musical critical edition.

The format of this edition is similar to that of traditional editions, only housed online. It is broken up into eight series, with compositions separated by genre: keyboard, chamber, orchestral, oratorios and passions, choral, songs and vocal chamber music, theoretical writings, and a supplement. Before the advent of this edition, C.P.E. Bach was well known for his body of work for the keyboard. This is because a very sizable portion of his choral work was unavailable for the public since World War II, due to a dispute between Russia and Ukraine. Each volume

contains a critical report. One defining characteristic of this edition that sets it apart from others is the introduction of the idea of a "living" edition. While there is a hard copy version of the edition, the online component will be updated with new material or changed to reflect current academic thinking on a certain area of the musical work. This provides editors with the ability to correct mistakes and in a broader sense, to have agency over the content in a way that would never be possible with a static text. This is actually a great step in the way in which musical works are thought of. Rather than having a static text that is unchanging in a dusty and underused book, the text can be modified to represent the current academic conception of the work.

This edition is notable as well for the nature of its funding. It is the first scholarly musical edition planned and published by a private foundation in the United States. This is a significant shift, as a project this ambitious could only be funded by a private organization with deep pockets. Similar to the way in which Disney is developing their own archive (DDO), this project is the work of a private institution. The evolution of these editions will require a large amount of resources. So in some sense, a pre-requisite for an advanced digital edition will be commercial viability, or significant interest from a private organization with a very large amount of funding.

The Kurt Weill edition is significant for a number of reasons. The editorial guide that was authored for the creation of the Weill edition is the framework that is being used by the Gershwin Initiative. Weill and Gershwin share a number of similarities. They were contemporaries of each other, as both composers were very prolific during the 1920's-30's. Both wrote a number of musicals and songs, and their body of work is similar enough that the framework established by the Weill editorial guide is capable of serving the needs of the Gershwin Initiative.

A facet of the Weill edition that is particularly relevant to this capstone is how self-aware

and meta-analytical it is. My experience with the edition is predominantly through the *Guide for Volume Editors,* so that is where I will focus my attention. This was a document prepared for editors to read before contributing to the Weill edition. It was also given to me when I began working on transcribing *Rhapsody in Blue*. The very first paragraph of the text reads, "The editorial work on each piece included in the Edition will naturally break new musicological ground, and the newly granted access to the texts themselves should provide scholars material for many years of rewarding exploration." (Drew, 1) The text provides such a detailed description of the editorial process that they were completely confident the text would break new ground. This is due in large part to the amount of thought given to the treatment of Weill's distinctively eclectic body of work. The text is incredibly precise in its intention, but is particularly dense as a result.

An approach adopted by the edition is to address the fact that different bodies of work have distinctly different requirements. Rather than having a global strategy to force all pieces to conform to a universal set of guidelines, consistency is maintained within bodies of work. This is a great example of innovation in the world of editions. I would not be assured in saying that this is the first edition to employ such a method, but it is a development from early musical editions that have wildly variable degrees of editorial commentary and consistency.

The core of the editorial guide can be broken down into 4 axioms:

Axiom 1: Musical works are not fixed and unchanging but dynamic, to a greater or lesser degree.

Axiom 2: The history of a dynamic musical work and the text of that work are not distinct but interrelated.

Axiom 3: A text is capable only to an imperfect degree of transmitting the musical work that it signifies.

Axiom 4: A complex of sources is capable only to an imperfect degree of documenting the stage of development of a dynamic work at any given moment. (Drew, 4)

These axioms are a sort of manifesto for the edition. It is rather heavy handed to speak in terms of axioms, but I rather like the ultra-crystallized form of the editorial mindset. The first axiom acknowledges the fact that musical works are dynamic instead of static. This is really saying that musical works change. The second axiom introduces the notion that the actual representation of the musical work and the history of the musical work are highly related to each other. This is an especially relevant axiom to the *Rhapsody in Blue*, as there is a high degree of debate as to the text of this piece. An additional insight that can be gleaned from this axiom would be that the editorial process is continually evolving along with the music that it is analyzing. I believe the third axiom is what got me thinking about how to improve the musical edition. The realization that a text is capable only to an imperfect degree of transmitting the musical work that it represents. The entire core of my capstone is centered around how we can improve the text. How it is possible to iterate on the form of the text. If we can improve the text, we can increase the degree to which a musical work is transmitted by the text. Not to a perfect degree, as I will indeed agree with the authors in their exact rending of the text. I do not think that it is possible to achieve a perfect degree of transmission in this context with any amount of existing technology. The fourth axiom really cements the fact that the piece changes over time, and will continue to change over time because the performance practice of the piece is liable to develop in myriad ways that are completely unforeseeable.

My Proposed Digital Edition (PDE) is structured partially as a response to these axioms. The incorporation of footage of performance practice is largely influenced by the fourth axiom. Inclusion of performance practice can be tailored extensively to suit the needs of the piece, much in the same vein as the editorial standards are tailored to the needs of the particular genre in the Weill edition's framework. The ability to update the text over time is connected to the realizations of axioms 1 and 2. This is an improvement to editions that was successfully accomplished by the C.P.E. Bach edition. The implications of the interrelation of the work and its' history drives the desire to represent the history more prominently in the presentation of the text, which has led to the design of the functionality outlined in the Design Specification at the end of this capstone. It would be an oversimplification to say that my work is an attempt to improve upon the implementation of these axioms, but this guide as well as many conversations with Professor Banagale about the editorial guide were fundamental pillars of my thought surrounding improvements to the musical edition.

All of the editions that have been discussed attempt to incorporate some new techniques. The *Snow White* edition leveraged art from the source material, and enhanced the images present to create a more immersive document. The *C.P.E. Bach* edition is using the digital format to enable a "living edition." The *Kurt Weill* edition is framed entirely in the scope of past editions, with acknowledgement to shortcomings and strengths of editions that preceded it. One element that is consistent across the recent editions that I have discussed is the reflection upon what an edition should be, a degree of meta-analysis.

My involvement with musical editions began with my work on *Rhapsody in Blue*, in the summer of 2014. I will discuss the process that took place and the influence it had on the Proposed Digital Edition.

Rhapsody in Blue is an iconic piece of American Music. It was composed initially by George Gershwin in 1924, for performance by the Paul Whiteman Orchestra. Over time it has come to exist in numerous arrangements for a diverse collection of ensembles and solo performances. There are many myths and legends surrounding the *Rhapsody*, starting with the composition of the piece and continuing until the present day. All of the biographies on Gershwin indicate that the *Rhapsody* was composed over the span of a few weeks. Past scholarship suggests that many of the themes present in the work existed before the actual period where the *Rhapsody* was composed (Schiff, 13). Many of the musical elements present in the piece were representative of what music critics of the time ascribed as defining features of jazz. These elements include mutes used on wind instruments (see Ex. 1), Glissandi (see Ex. 2), "fox-trot" rhythms, 3+3+2 rhythms, blue notes, subdominant modulations and augmented-sixth chords (Schiff, 32.) These elements are referred to as "ascribed" because whether or not such elements are actually defining features of jazz is not a claim that is being made.

Ex. 1: [Mute/wa-wa effect, mm. 16]
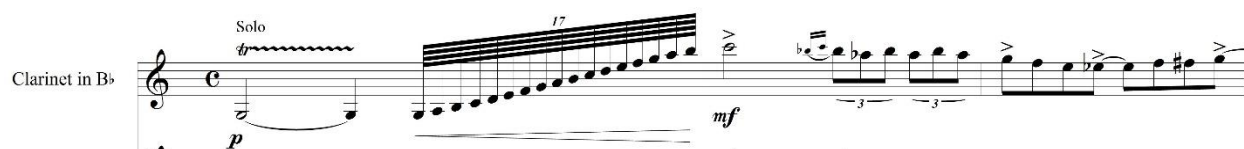
Ex. 2: [The famous opening section, mm.1]

One difficulty in writing about the *Rhapsody* is separating the extensive amount of mythology that surrounds the piece from the actual truth behind the piece and its composition. It is known that Gershwin's attention was divided during the period in which the Rhapsody was composed, as he was composing his musical *Sweet Little Devil* at the same time (Banagale, 34).

An ongoing point of discussion on this piece is the interplay between the actual composition of the piece and the arrangement. Gershwin has indicated many times that Ferde Grofé, the arranger of the piece as performed initially by the Whiteman Ensemble had a very small level of involvement with any sort of creative or compositional aspect of the piece, a claim which has been challenged extensively in Ryan Banagale's recent book, *Arranging Gershwin: Rhapsody in Blue and the Creation of an American Icon* (Oxford University Press, 2014). This is exemplified in the following quotation from Gershwin to ASCAP general manager J.C. Rosenthal:

> Mr. [Jerome] Kern at lunch the other day brought to my attention that Ferdie
> Grofe had listed among his compositions "The Rhapsody in Blue."[…] Mr. Grofe
> made a very fine orchestration from my completed sketch but certainly had no
> hand in the composing. (Banagale, 14)

Collaborative research projects at CC allow faculty to involve students in their research. Professor Ryan Banagale got me involved with his research on the *Rhapsody*. During the collaborative research project, roughly 23,000 notes were entered into the draft of *Rhapsody in Blue*. Over 40 pages of 11x17 music score were produced from the source images that exist in the Library of Congress. The actual transcription of the document took place in my apartment. I would sit at my desk with one screen displaying the images from the library of congress, and with another screen inputting these notes into Finale. Then, after completing a particular passage, I would compare the digital version that I created in Finale to the source manuscript multiple

times. This was to ensure accuracy of only the notes without articulation or other additions. This particular component of the transcription process presented some difficulties, as the handwriting on the manuscript was occasionally hard to make out. With the number of instruments present, keeping track of each line and instrument transpositions took a lot of focused attention.

Ex. 3: [One of the more challenging sections. mm. 26]

The first pass through generated a document containing the instrumental lines excluding piano cadenzas, articulations, dynamics, and other expressive text. After becoming more familiar with the way in which Finale works, I was able to more easily tackle the difficult sections of *Rhapsody in Blue*, such as the piano cadenzas, which feature advanced and idiomatic piano passages.

The piano cadenzas proved difficult for a number of reasons. I had to familiarize myself with the advanced tools in Finale to capture some of the elements present in the manuscript. There are certain sections of the piano cadenza that required use of all four layers in Finale. This means that there are four distinct layers of notes on the staff, each containing a measure worth of notation. There were numerous instances of cross-staff note barring. The technicality of the piano cadenzas required much more advanced functions of Finale to be utilized. Fortunately, I was also working with Professor Vicki Levine the same summer of the research project on musical examples for the text "*This Thing Called Music: Essays in Honor of Bruno Nettl.*" This

project involved creating versions of documents produced by a number of different ethnomusicologists for publication. Some of these examples required advanced techniques, such as representation of microtonal notation, complex note barring, and other document manipulations. I was able to transfer some of the techniques I used from the separate work I did for Professor Levine to tackle some of the more difficult passages of *Rhapsody in Blue*.

We shifted gears towards the end of the project, focusing on musical elements other than notes. After a draft of the *Rhapsody* was created containing all of the instrumental notes present in the Grofé arrangement, work began on transcribing the other elements such as expressive text, dynamics, and other musical information outside of notes. This began a slightly more interesting portion of the transcription. Once all of the notes were entered, and most of the expressive text entered, I attempted to arrange the music in a way that made sense according to the form of the piece, and for performance purposes.

Throughout the summer, I spent roughly seven weeks working on the edition of *Rhapsody in Blue*, and roughly three weeks on developing software to aid in the creation of the edition. The software I developed, called "Critical Tools," is designed to help the process of editorial review while creating a critical edition. It does so by allowing a user to create a database of images that compose a source text, and allows the user to browse through the images in a streamlined manner. It also allows the user to find a specific measure of music from the source text to compare to the edition that is being created in digital notation software. I noticed that I spent a significant amount of time trying to keep my bearings on the source images that I was dealing with. I had in my possession a collection of images from the Library of Congress taken by Professor Banagale that were collected in a folder. The photos were loosely organized by manuscript page, with a variable number of images per page of manuscript. This was due to the

variation in amount of content per page in the manuscript. This scheme was not the best way for me to be able to quickly go to a particular page, or a particular measure. The software came out of my background as a double major in Computer Science, and this short period of time where the transcription was put on hold.

The software was written in Java, which I learned from both my education at Colorado College and through independent programming projects similar to and including Critical Tools. This software got me thinking about the application of computer science to critical editions generally, and in a way has prompted some of the ideas on the creation of digital editions of the future. The basic idea of being able to interact with the music in a more meaningful way is perhaps the core of the mission to create a new type of digital edition.

This particular arrangement has several source documents, including the two-piano score that Gershwin himself originally penned, a fair-copy in ink, and the full score that Ferde Grofé prepared for the Whiteman Ensemble from Gershwin's two piano score as well as the fair-copy ink document. This is an important process because a digital version of *Rhapsody in Blue* does not exist currently. The work that we accomplished during the grant provides a foundation for the version of *Rhapsody in Blue* that will ultimately be published in the Gershwin Critical Edition.

As with all critical editions, our work went beyond simply reconstructing the original manuscript. The goal was to capture the essence of the piece, by modifying the piece to reflect numerous changes that have arisen in regards to performance practice and to "equalize" the piece by standardizing the markings (such as dynamics and articulations) that appear throughout the work. This is the aim of any critical edition, to create a definitive version of a musical work.

The edition of the *Rhapsody* was far from complete at the end of the summer research grant. After the collaborative research period ended, there was a draft performance of the arrangement that we edited at the University of Michigan. This occurred in the fall of 2014. Revision of the edition continued in the summer of 2015. The revision that was produced in the summer of 2015 was then revised again in the fall of 2015. Currently, there is another draft performance scheduled by the Reno Philharmonic in the spring of 2016. The piece is still under revision to this day, as each note, accidental, and articulation must be thoroughly checked and considered to ensure compliance with the editorial guidelines. The end of the project is hopefully in sight, currently scheduled for publication in the summer of 2016.

My involvement with the creation of the Rhapsody edition provides the foundation for the main idea of this Capstone, which is a new platform for creating and interacting with musical editions. With the discussion of past editions, present developments with contemporary editions and the process of creating the *Rhapsody* edition in mind, we can now explore the potential to leverage technology to create a new sort of edition.

I propose a theoretical (not implemented) piece of software that will enable critical editions to become more useful and more used by a wider range of musicians. This capstone includes a design specification, which aims to give a high-level overview of the functionality of this proposed software. For sake of convenience, I will refer to this concept as the "Proposed Digital Edition" (PDE). This project seeks to address the fundamental issues that are present in past and current editions. It is incredibly ambitious, and the implementation of such a project would take a number of years and require a very large and experienced team. I will present a finite set of features, but this set of features will be very broad in scope. A central aim of the proposed project is to retain all of the current use cases for editions.

As discussed earlier in this paper, there are a number of issues with the format of a traditional edition. The lack of translations of critical reports into a variety of languages provide a barrier to the understanding of musical works by musicians with different language backgrounds. The format of traditional editions, which are generally very large bound textbooks that can span many shelves, is comparatively inaccessible when viewed in terms of how students leverage technology currently. The digital format already allows editors working on recent editions such as the C.P.E. Bach edition or the Digital Mozart Edition to address the idea of a "living" edition. The PDE will push this idea of a living edition further in a variety of ways.

The issues that are presented by traditional editions do not end with lack of translations or the inability to update material to reflect current thinking. A fundamental issue of traditional editions is the idea that a single version of a musical work can be "definitive." The push for editions has been to create this single version of a musical work that somehow becomes the best representation possible. This presents a number of problems. An issue that is easily illustrated by the *Snow White* edition is the question of what constitutes the best representation of a work. The material within the *Snow White* edition provides a number of insights into how the work was composed, and the practice of actually capturing the music to apply it to the film for which it was composed. But the edition would completely fail as a performance text. This has led me to believe that there is no single best representation of a piece of music, there is a finite set of best representations of a piece of music that are dependent on their context and application.

Another issue of traditional editions, from my personal perspective, has to do with the somewhat subjective and perhaps controversial notion of user experience. This may seem completely irrelevant to the discussion, but with the privatization of recent editions and the direction in which editions appear to be moving in, this issue may present its self in the near

future. Traditional editions are almost by definition boring. The experience of manually parsing through the index of an edition that is written in a language that is foreign to the user, skipping over a large amount of explanatory text that becomes irrelevant with said language barrier and trying to find relevant material is far from an ideal method of knowledge transmission. There is so much incredibly interesting information that exists in the canon of western art music. From historical context to details of a composer's personal life as they pertain to composition, and even the minute differences that editors pour over in the creation of an edition. This type of information has been housed in critical reports and in footnotes. This is due to the format of editions. There is not a great place to put relevant information on an actual page of a score, as that would detract from the performer's ability to utilize a score. Suffice it to say, there is a significant barrier for persons lacking in an advanced degree of musical training, as all of the engaging and provocative information tends to become buried in the detail of the volume itself.

The PDE would be able to reconcile this issue by presenting this information in a context-dependent manner. While a performer could toggle off these details, many other users could interact with these fascinating details in a meaningful way. Creating an edition that is held to the highest academic standard should not be mutually exclusive with creating an experience of the music that is engaging and entertaining. This idea is informed and reinforced by the movement of recent editions to private funding. A particularly pertinent example is that of the *Snow White* edition.

Ideally, the format of a new digital edition will enable a wide variety of different musicians to be able to use editions in a more meaningful way. One goal of the PDE is to create a variety of "views." That is, a number of different scopes that will provide different insights into the piece. A crucial requirement for the PDE is to meet the needs that have been met by

traditional editions, and at a bare minimum retain all of the current use cases. The eventual hope

of the PDE would be to expand the target market for consumption of musical editions.

Performers would be able to view a performance ready version of the piece, with very

little editorial feedback or other information. This would be one of the areas that technology

would be utilized not for the purpose of increasing immersion or providing depth of background

information, but for the purpose of creating a platform that would enable performers to have a

readily performable text in an accessible format. Musicians that are seeking a performable

version of the work are not excluded from viewing the different views, they are provided with a

readily performable copy of the work but will hopefully utilize the different views to inform their

performance based upon insights gained from non-performance views.

Music scholars would be able to access the information that they have always tried to

seek out. At the core of the PDE is still an authoritative and definitive version of each musical

work. The supplementation of additional content is not a substitute for rigorous scholarly

investigation. At a minimum, this digital platform will allow for access of information that was

historically contained within the critical report section in a multitude of languages. Ideally, this

information would be conveyed in a format that allows for understanding to be achieved across

language barriers, but this type of functionality may be utilized more effectively by users that are

not music scholars.

Beyond performers and music scholars, the PDE is designed to reach new users that

would otherwise underutilize or simply never utilize musical editions. Lay people would be able

to access and understand the edition through certain views that are tailored to those who have

little to no formal music training. Perhaps this software could be used to guide students to

information keyed to early education, high school, and college with varying degrees of detail and

complexity. The current deficit in music education could be addressed with the use of this software, enabling institutions that would not otherwise be able to afford a rigorous musical edition to provide their students with an automated approach to music. Beyond the ability for continuous updates and revisions, the leveraging of technology can allow an edition to become so much more than previous editions. By reaching out to new audiences, editors of the PDE will have more agency over how musical works are perceived by a larger set of people.

There are other strengths that the PDE can offer over traditional editions. This new digital edition can perform in a number of ways that a traditional edition cannot. Past editions have been broken up into three broad categories: critical, performing, and facsimile editions. The PDE creates the possibility to unify all categories into a more complete edition. By enabling context-dependent interaction with the edition, a user can choose which content they would like to use at any given time. Digital editions are already attempting to create a "living edition" in the vein of the *C.P.E. Bach* edition, which is one facet of the PDE that has already taken root in the world of editions. However, "living" in this context really only refers to the ability for editors to continually amend and update work. The medium is still largely unchanged for this type of "living" edition; it is still tied inextricably with the old format of large volumes. The PDE would create a truly living edition that would react to users in a way that is impossible with the traditional format.

The notion of interacting with the piece in some meaningful way is the intention of the Immersive view. One facet of a piece of music that is almost always meaningful is the performance practice of the piece. The Immersive view would provide a score that lights up with the notes currently being played, and footage of the performance as well. This would help users

connect the musical work with its performance, and also allow editors to draw the user to certain elements of performance.

A large trend in software engineering is the move towards a platform-independent or a multi-platform approach. This will be an approach that will be used for the PDE. The point of this undertaking would be to create not only contexts for content, but also different contexts for consumption of said content. In other words, a successful implementation of the PDE would allow users to use a variety of devices, including everything from a tablet to a desktop computer and everything in between. There has been a movement in recent years towards the use of tablets or similar devices in performance.

There are some challenges in making the PDE come to life. First, there would need to be an organization with both the substantial amount of funds and the substantial amount of faith that would be required to develop this huge undertaking. Either that, or a significant and capable open source community would have to step up to the task. We have seen how private institutions are beginning to create editions, such as Disney's effort with the *Snow White* edition. However, it is unclear as to how copyright would play into this new type of edition. A large motivation for works of the twentieth century to be captured in editions comes not only from the desire to canonize significant work, but also from the desire to maintain intellectual property.

I will now present the Design Specification for the Proposed Digital Edition. Design specifications are used in software engineering to lay out the requirements and functionality of a project. My design specification does not go to the functional level, where I would explicitly define each and every function that would be required to accomplish my task, rather it takes a high level view of the functionality and purpose of the software.

Design Specification

Mission statement:

It is well understood by musicologists that it is difficult to create a singular representation of a work in an edition that is "definitive." The paper format of a critical edition lends itself to this idea of a single representation of a piece of music. This presents a number of issues. Musical works are not a static, unchanging being. Works go through an extensive amount of change during their composition and changes continue to occur well beyond that initial composition period. Performance can have a great impact on a piece of music. Case in point, the initial measure of *Rhapsody in Blue* which is written as a major scale but has always been performed as a sliding glissando by the clarinet.

Why should orchestras and other performers be forced to use 80-year old texts that were not authored in a scholarly manner? Why should we relegate ourselves to use an outdated medium such as an oversized musical textbook when we have so many digital options?

Goals:

1. Create a musical experience that allows for deeper understanding of a given musical work.
2. Provide audience-based contextual information.
   a. Multiple "views," where a user can view different information based upon their background or current interest.
   b. Considering the audience will allow for variability in the depth of analysis/information not contained within the actual musical work.

3. Provide the most authentic version of the text possible, with the ability for editors to update their definition of what is truly the most authentic.

Features:

1. Functionality for user to be able to compare various versions of a given musical work.

    a. "Definitive" copy (one that would appear in a standard edition)

    b. Various stages of work-in-progress copies (dependent on availability)

2. Ability to access the edition in multiple ways (desktop/mobile)

3. "Commentary" mode that allows editors of an edition to add insight.

    a. Allows for relevant information to be accessed by interested users, while allowing for a user that is more interested in performance to hide such material

4. Ability to view different arrangements that exist and make comparisons.

5. Multimedia incorporation ability. Users will be able to view relevant audio, video, and images to a given work for context.

Views:

High level breakdown of views:

Educational: primary focus is on learning

Performance: primary focus is on performance

Immersion: primary focus is on creating an immersive experience

1. Academic view

    a. Highest level of detail for explanatory information. Target audience: undergraduate level through professional academic.

b. Inclusion of elements about history, bibliography, related documents, first performances, etc.

2. Educational view

    a. A higher level of detail, but aimed at a secondary education audience. Reminders about certain aspects regarding notation, performance practice, and music theory will appear in a context-dependent manner.

3. Early educational view

    a. Aimed at a young audience. Content would be structured in a very child-friendly manner, in the vein of Sesame Street or something similar. Curriculum for early childhood musical education could be incorporated, improving access of all children to the arts.

4. Performance view

    a. Low level of detail. Performers may be interested in the contextual information contained in other views, but a version for actual performance contains no academic/explanatory information and provides the "cleanest" copy of the musical work.

5. Immersive view

    a. Provide a documentary style view of a given work. Interviews with the composer, footage of performances, and even interviews with academics and performers of note. Highly variable, dependent on the particular work.

Bibliography:

Bach, J.S., *Werke*, ed. Bach-Gesselschaft i-xlvii. Leipzig, 1851.

Bañagale, Ryan Raul. *Arranging Gershwin: Rhapsody in Blue and the Creation of an American Icon*. New York, NY: Oxford University Press, 2014.

"Digitale Mozart-Edition." Digital Mozart Edition Home. Accessed August 17, 2015.

Dean, Jeffrey. "editions, historical and critical." *The Oxford Companion to Music*. *Oxford Music Online*. Oxford University Press, accessed October 28, 2015, http://0-www.oxfordmusiconline.com.tiger.coloradocollege.edu/subscriber/article/opr/t114/e2188.

Drew, David, (Author), et al. "The Kurt Weill edition." *Notes: Quarterly Journal Of The Music Library Association* 56, no. 2 (December 1999): 315-318. *RILM Abstracts of Music Literature (1967 to Present only)*, EBSCO*host* (accessed August 17, 2015).

Levin, Robert D. (Chair), et al. *Carl Philipp Emanuel Bach: The Complete Works*. Packard Humanities Institute, publication ongoing.

University of Michigan. "The Gershwin Initiative." Gershwin. Accessed August 17, 2015. http://www.music.umich.edu/ami/gershwin/.