

**CHORAL LIBRARY MUSIC DATABASE  
PROJECT**

An Interactive Qualifying Project Report

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WORCESTER POLYTECHNIC INSTITUTE

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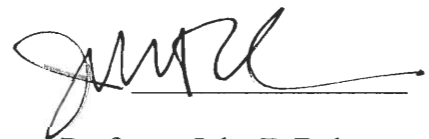
Degree of Bachelor of Science

by



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## **ABSTRACT**

The purpose of this project was to construct an electronic database which would record a variety of information concerning music owned by the Choral Music Division at WPI. Using this database, an efficient system was designed for the lending out and returning of music. The database, while recording useful data about the musical pieces including historical and practical information, also functioned as a reporting system. Reports could be generated outlining information on students who failed to return their music and how much money they owed the department. This project encouraged the responsible caretaking and returning of music by putting financial responsibility for the music in the hands of the borrowers.

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## **ACKNOWLEDGMENTS**

I would like to thank first and foremost my IQP team members, Michael Breen and Lauren Lilyestrom, for their time, effort, and energy in this project. I am grateful to Brandon Kershner for his experience and help in revising the database. I would also like to thank Walid Khoury for help in obtaining reference material on database construction. Lastly, I would like to thank Professor John Delorey of Worcester Polytechnic Institute for his ideas, patience, enthusiasm, sponsorship, and guidance.

Over the years since its inception, the Choral Music Department at WPI has accumulated a large volume of assorted musical works, which it often lends out to the many students who partake in its various performance groups. The music historically has been stored in two separate closets and organized with an inconsistently updated card catalog system. This system recorded a minimal amount of information, being comprised solely of the composer and title of the piece along with the specific shelf location where the piece could be found.

The way in which music was lent out to students was not particularly organized and because of this was problematic. Distributing music was the responsibility of the music librarian (generally a work-study student of the WPI Music Department) who would allocate musical pieces to students at the request of the director. No official system or protocol was previously designed to aid in this responsibility. Music was often not numbered and no record was kept detailing the exact copies of music individual students received. Students were not financially responsible for the music that was lent to them, and as a result of this it was not uncommon for student to lose their music.

Not only did this lack of organization cost the WPI Music Department a significant amount of money to replace the music, but it prompted several students to take copies of music they were missing from the folders of other students. This caused general confusion, as it was never clear who was responsible for misplacing their music and who simply had their music taken out of their folder by another. As blame could not be easily placed on specific individuals, rarely were students held responsible for the proper caretaking of their music.

The card catalog system was also in great need of updating. It was not uncommon for a piece of music to be on the shelf but not have a corresponding record in the catalog. Therefore, the only reliable way to be sure the department owned a particular musical score was to sift through all the shelves of music owned by the department by hand and search for it. Obviously this process took large amounts of time and was excruciatingly inefficient. Unfortunately, if this tedious step was circumvented, one chanced the possibility of ordering music already in stock. This has happened before and should be avoided in the future as to reduce unnecessary spending.

The catalog system would have a greatly increased utility if it were to contain an expanded volume of information. As mentioned previously, only a sparse amount of data were recorded per card entry. This only made the card catalog useful for locating where music was stored, and didn't allow for more sophisticated means of organizing and categorizing music outside of doing so by name and composer.

Because of this set of problems and inadequacies with the cataloging and distribution scheme used in the past, my IQP team was assembled to construct a new system. Our goal was to construct an electronic database which would be used to catalog various historical and practical information on the musical works owned by the department. This information would be useful for the director to easily and quickly browse the musical library for works related by a range of different criteria (composer, date published, length, difficulty, voice parts, etc). This would be useful for rapidly and efficiently identifying several pieces which are related by a similar theme for concerts and performances. In addition, the database was to be made available over the network

to allow access to its records anywhere and by anyone who was given the appropriate security passwords.

On top of building this database, my IQP team was responsible for designing and implementing a protocol for distributing and recollecting music to the different performance groups of the WPI Choral Division. This system would use barcodes to tag music. The labeled music would also be numbered; this data would be entered into the previously mentioned database. Students would be allocated music and held accountable for its proper maintenance and for its return. Information on which students were lent which copies of music would also be recorded on the database. This would allow for an indisputable source to reference when identifying individuals responsible for missing music.

The first part of this project my IPQ team undertook was to research preexisting, publicly available music databases to both get an idea of how these professional databases were constructed. In addition, we wanted to see if there was publicly available software relevant to musical databases. [www.musicanet.org](http://www.musicanet.org) and [www.choralnet.org](http://www.choralnet.org) were extensively searched for these reasons. While we developed many ideas of what should be included in our database, we discovered that there was no readily available software package which we could use which would be useful for our highly specific needs.

As no relevant software was available, building a temporary prototype of the database was our next endeavor. This was primarily to store all the important information that would be necessary to have when our entire plan was to be implemented before a final version was completed. At the time no one in our team had sufficient

experience with database construction to make it as professional and user-friendly as we desired; because of this the preliminary version was necessary.

Research had to be done in database construction before work could begin on the preliminary database. The book *Access 2002 for Dummies* was ordered to provide a basic starting point (Microsoft Access being the database program which was used). I read this cover-to-cover in order to acquire a solid understanding of this skill, which would be important for the overall success of the project. In addition, several other books that went into greater detail were borrowed from different sources; these functioned as references sources for complex topics that weren't covered in detail in the first book.

The first database was largely designed by me (with suggestion from John Delorey and help from one of my IQP partners Mike Breen) and consisted of four tables: main, copy, folder, and student. "Main" contained the practical and historical information on all the different pieces; it contained several fields, including title, composer, date published, length of piece, difficulty for conductor, difficulty for singers, solo information, and necessary voice parts. The "copy" field stored all the bar code and copy number information. In addition, every copy of music was associated with a particular entry in the Main table, which allowed for the circumvention of reentering information about a musical piece whenever a new copy had to be entered into the database.

The student table stored a list of all the students in a particular performing group. For example, the Glee Club student table would contain all the names of active members of the Glee Club, and the separate Alden Voices table would record all the Alden Voices



members. In theory, if music were to be lent out to different parties (say, for example, another school wanted to borrow some copies or a visiting chorus was using our music) new tables could easily be created for these groups.

Every student was assigned a folder number. Folder information was stored (not surprisingly) in the folder table. In addition to copies of music, folders were numbered and barcoded as well. The folder assignments were recorded on the database. Copies of music lent to students were electronically associated with the students' folders via the database as well. The folder table more or less linked together individual students with the music that was assigned to them.

These tables contained the information needed to implement our system of distributing music to the performance groups. However (as mentioned before), because our IQP team's inexperience with this sort of work, the database wasn't as user-friendly as desired for the final product. This was very important, as the database would have to be used by many other people in the future who didn't take part in its construction and therefore would not have a good preexisting idea of how it worked. Also, our team didn't know how to program the complex reporting system for notifying students of unreturned music. Another student, Brandon Kershner was recruited to the project in order to finalize the database. He was doing this for MQP credit and had previous experience with making database.

It was decided that all new music purchased by the department along with old music being used this current year by any of the performing groups would be barcoded at the start of the academic year. The rest of the music library would be slowly phased into the database as more music was used. Work-study and independent study students would

also be recruited later to enter in additional musical works in order to hasten this process. With an early working version of database complete, the music could be barcoded and entered.

The monotonous process of barcoding, numbering, and scanning the folders and copies of music into the database took place early on in the year. Mike and I did this. Fifty folders were prepared for both Glee Club and Alden Voices, with specifically numbered folders being filled with all the appropriately numbered music for whichever group. After a week or two of rehearsals, once it was relatively well established which students were going to remain members throughout the year, folders were assigned. This was subsequently entered into the database. Lauren Lilyestrom took care of this process, and I (along with help from Mike) did so Glee Club. A handful of students joined Glee Club later in the year, bringing the total member count above 50. Additional folders were soon numbered, barcoded, and distributed.

We hoped that with the music being barcoded, the problem of students taking other people's music after they've lost their own copies would be a non-issue, as at the end of the year the stolen music would be credited to the rightful owner. Because of this, there would be little motivation to take other people's music. Unfortunately, this was not the case. While this problem occurred to a lesser degree, it wasn't completely corrected. As a way to further discourage borrowing other peoples music without permission, all members of the choral groups were asked to sign a form stating that they wouldn't borrow anyone else's music without their explicit permission. In addition to this, we made several extra copies of music available to sign out if one were to lose his or her

own. We also created an official form for reporting missing music and for requesting new copies.

Over the winter break, all the Glee Club music was removed from the folders. Pieces that were to be used in future concerts during the second semester were returned after ensuring that the correct copy was allocated to the correct folder. Other music that was no longer needed was filed back into the music library closet. All missing and damaged music was recorded.

While there were some damaged or missing copies, for the most part the vast majority of students had held on to all of their assigned music and kept it in very good condition. There was never an official record of how much music, in past years, was damaged or went missing. However, from being involved with the Glee Club for two years before this system was implemented, I strongly believe that the number of missing music copies has sharply declined. This is most likely because students are unwilling to face the financial consequences of taking poor care of their music and therefore are more mindful and careful with their music.

There is still a fair amount of work to be done to fully complete this project. This will be accomplished by my other two IQP partners and Brandon. It was previously planned by my IQP team and advisor that I would have the greatest responsibility to this project for the first half of the year in order to justify me leaving the project before its completion. This was done to allow me to graduate after the fall semester of 2003.

As mentioned before, the actual database needs to be improved in order to make it more user friendly. A simple menu system has to be created to help guide users to where they need to be on the database. For example, there should be one button links for

entering music into the database, assigning music to folders, generating late music fee reports, and searching for specific copies of music.

The report forms need to be reworked to look more professional and official. While this may seem like a minor detail, it is important for students receiving notifications generated by the database to take them seriously, and making the report print outs appear more official will aid in this.

Many instructions and manuals need to be written out about a variety of topics. First off, one must be made describing the details of how the database was constructed. This is so other people will have a better idea of how to manipulate the database further to accommodate future needs and how to repair something in the database if it becomes damaged.

Instructions for the responsibility of the music librarian must be written out. This should detail a time line for when he/she should hand out specific forms, barcode music, hand out missing music report forms, etc. This set of instructions will provide an outline for what the music librarian needs to do and when the librarian should do it. These instructions will insure that our system of music distribution is correctly carried on in the future.

The music library closets must be organized and cleaned out. Musical works that have no record need to be unearthed and documented, and entries in the card catalog that don't have corresponding copies of music on the shelf should be removed. As it will take many years for the electronic database to render the card catalog obsolete as all the music must first be barcoded and scanned in for this to happen, the card catalog should be kept

in working order. This process has already been started, being spearheaded by Lauren with help from Mike and myself.

While there is still a good amount of work to be done, the music library project has already begun to significantly change the way the Choral Music Division at WPI handles and distributes its music. The new systems and protocols, although in their infancy, have already saved the department a good amount of money by encouraging students to take better care of their music. After the necessary manuals and instructions have been completed, the music department should benefit from this largely improved system for years to come.

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