

TEAM NOVA ELITE

CSCE 4901 – Computer Science Capstone

Project Plan

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University of North Texas
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Introduction

This document is a Project Plan created to compile the requirements for a proposed application project and discuss the strategies, tools, and methods to be used towards building and completing the application. Team Nova Elite is the team behind the construction of the proposed project and will also be tasked with refining the base product and any extra details that arise throughout development.

The Team consists of the following members who each currently attend the University of North Texas in pursuit of a degree in Computer Science: Jason Hoang, Imran Akhtar, Kai-Chuan Chan, and Sabrin Thamed. We will use this project as an opportunity to learn more knowledge and skills about our science along with how to produce an application that is useful in the real world. Team Nova Elite is dedicated to ensure that the final base product is fully functional within the time given to complete the project.

The rest of the project plan will serve as an outline for the overall project. It will go into further detail about what the project is about, how the team will accomplish the requirements, and address the schedule for producing each aspect of the project. The plan will also help to keep track of the team's progress while developing and building the application and guide the project towards completion.

Description of the Project:

This project consists of a teacher app and student apps that communicate directly with each other, giving the teacher the ability to guide the students who spread across the marching field/rehearsal room via a single device and allowing students to ask questions and take notes with ease. The program will focus on compiling all of the paperwork, sheet music, and coordinate sheets involved with students learning, rehearsing, and performing a marching band show onto their own personal devices and tablets. This will make the process of teaching easier and help the students stay organized with all of their

papers. All apps will also have access to vital learning tools for a performing ensemble so that the students can practice with the app on their own. These apps will be designed for marching bands across the United States, but they can be adjusted to satisfy other indoor rehearsals for any type of ensemble.

The Client:

The client in question is a young North Texas band director named Chantal Hoang, who has high level experience and knowledge about the marching band. She has served as a member of the Carolina Crown and the Blue Devils Drum and Bugle corps in 2013 and 2014 respectively. Both of these drum corps are among the many professional marching bands in the world and in both of the years that our client has marched, she went to the world championships and won first place with both groups. Alongside Chantal's world championship wins, she has worked on staff with multiple band programs in the North Texas area teaching younger high school students about the art and physicality of marching band. Having recent knowledge of marching band on both sides of the field, the student and the teacher, Chantal is a highly qualified client to help develop this project within the current generation of teaching marching band.

Objectives:

Team Nova Elite is tasked with producing an application that serves a portion of the general public. The students who were assembled for this team are working together for the first time in their careers and therefore have put together a list of objectives for the team to achieve alongside producing the main application:

- Build an application that serves music educators in the field of marching band at a high and efficient level.
- Form an inviting and hard working environment for each member of the group to feel comfortable working with and complete a successful project.

- Produce and understand the other side to producing an application of this scale in terms of documentation and compiling all of the other team members' work and data.
- Strive for punctual completion of each requirement and feature of the project with the initial focus on functionality.
- Learn and be comfortable with new IDEs and programming languages that are commonly used in the field.

Constraints:

Some of the constraints that the team will encounter and overcome throughout the development of this project:

- Time constraint of approximately 3 months to learn, build, and complete a fully functioning prototype for the project.
- Scheduling constraint due to having to build and develop the project alongside a full college level semester. Not all team members will be able to meet and work together at reasonable and convenient times.
- Limited to the number of tablets and uniform devices to test and produce the application onto.
- Constrained by the amount of knowledge available to research and apply towards the development of the project.
- Feature constraints due to the level of difficulty in producing an application that operates with music files and drill coordinate files used by various music education software for marching bands.

Project Organization

This project will be organized into three main phases: Building the database, developing the student app, and developing the communication system with the teacher app.

Each phase is connected and allows the development of the overall project to flow. We cannot begin to work on the main applications without the database, the teacher app in its basic form is a copy of the student app with other more in depth features and requirements that we will need to add after copying over the student app, and we cannot begin to develop the communication systems without having the two applications working.

As stated before, we will start with creating the database. That database will have different types of information about students, teachers, music, marching coordinates, and other needed variables required by the educators. These organizations will need the database to insert and access these data throughout the application.

The entire team is tasked with working together to build the database in the beginning of the program along with designing some of the other requirements of the project.

Next the team will break up into groups of two to work on different aspects of the student app. We will take this approach until we have developed all of the main features that are needed to copy over to the teacher application. Once the base functionalities for both the student and teacher apps are built and assembled, the team will break off from working on the same app and split the work between both of the apps and start developing the specific requirements either app.

Finally, the team will collaborate to work on the communication systems between the two apps along with fixing any problems that are encountered and adding any other requirements to the project.

Deliverables

The project will also have set deliverables that will help to track our progress with the project. It will also give the stockholders an idea of how we will be managing and developing the project.

- **Project Plan:** This will serve as a guide for how the team will build and develop the applications throughout the course of the semester.
- **Requirements Specification:** Set by the client and workable with the skills and abilities available to the team programmers. Defining the requirements needed for the project will help to deliver a full and useful application for the client to use extensively.
- **Design Document:** This document will show how the team will design each aspect of the application such as the database, the main screens, and the functionality behind the toolbar. The design document will also show how the team will assemble each aspect and visually show how each component of the project interacts with the others.
- **User Manual:** The user manual will instruct the client and other users of the application specifically how to operate each function available.
- **Delivery Plan:** The delivery plan is the final document that will plan out how the team will present each requirement and function of the project along with how it works. The plan will also address how the team actually worked and developed throughout the semester on the project.

Roles and Responsibilities

The following chart assigns the roles and responsibilities for each member of the project team:

Role	Name	School	Project Development Responsibility
Team Leader	Jason Hoang	UNT	Lead designer of the project; lead writer/editor for all documents; also tasked with writing the code for the music side of the applications.
Senior Programmer 1	Kai-Chuan Chan	UNT	Lead programmer for the database code and the communication functionality between the student and teacher apps
Senior Programmer 2	Imran Ahktar	UNT	Lead programmer for the log-in functionality and the basic functions for the main screens.
Senior Programmer 3	Sabrin Thamed	UNT	The team's lead Android Studios consultant will also be the lead programmer for the application's toolbar functionality.

Risk Analysis

Risk	Solutions
<p>Upon developing this project, there are many factors preventing us to complete each task. Such risks include:</p> <ul style="list-style-type: none">• Our ability to complete the project because of our knowledge.• We are a team of four and is new to the work field.• None of us have actually developed an android application in java or have extensive experience with java.	<p>Our group has many years of experience in other languages so learning a new language shouldn't be too difficult.</p>
<p>Another risk factor is requirement changes. It so might happen that the client will ask us to make changes in our project to fit his or her criteria.</p> <ul style="list-style-type: none">• Because the field of education is always changing due to technology, the client might make a necessary request to keep the project relevant to the current curriculum.• Changing the requirements especially in the last second could put us in a lot of pressure.• Also we might have to change our style of approach while coding in order to accomplish the task.	<p>However if there so happens to be a requirement changes, we will work hard and make sure to fulfil the requirements within the giving time.</p>

Hardware Software

The Electronic Marching Band app will be for Android users due to tech limitations and development constraints. Therefore, we will be building the project using android devices and development software.

The development team will need 4 computers/laptops to work on the project and develop the requirements and functions for the project. These systems will need to operate with Microsoft Windows 7 or later version.

These computers also need to have installed the following software to develop the Android application:

- Java JDK5 or later version
- Android SDK
- Java Runtime Environment (JRE) 6
- Android Studio 1.5
- Android Development Tools (ADT)

Finally, the team will need a few Android devices to physically test each application extensively. We will utilize at least two devices, one for testing the teacher version and the other for testing the student version. The two devices will need to test for basic functionality and communication with each other. The Android devices can either be cell phones or tablets to satisfy the testing requirements, but it is preferred to test the teacher version on a tablet.

Work Breakdown

This is an open outline of the work breakdown need to build each major aspect of the project. The team will use this as a simple and basic guide for the requirements that we have compiled so far for the project.

Preparations:

- Meeting the client
- Install all of Developing Software
- Learning Android Studio
- Learning Database of Android

Building the Database:

- Create ER Diagram
- Create Database
- Insert Database
- Modify Database

Creating Login Screen:

- Log In to the database

Creating Music Screen (Main Screen 1):

- Music Menu
- Display
- Function of Swiping between Each Main Screen
- Function of Editing Music in Database

Creating Coordinates Screen (Main Screen 2):

- Coordinate Menu
- Display
- Function of Swiping between Each Main Screen
- Function of Editing data in Database

Creating Notifications System:

- Display
- Function of Sending Message between Teachers and Students

Creating the Toolbar:

- Display
- Tuner
- Metronome
- Notification access

Testing:

- Log-in function
- Main screens' database access and functionality
- Use of the toolbar
- Notification system

Milestones

The project will have only three set milestones for the team to progress towards throughout development. These milestones will serve to keep the project on track and gauge the progress from each team member at each due date.

- Milestone 1: Implement log-in functionality - Complete by 2/29
 - This milestone will analyze the skills of the team's first task working together and will also help test the functionality of the database. Without the database, the rest of the project cannot be built to function as expected.
- Milestone 2: Finish building the basic student application and copy over to the teacher application - Complete by 3/31
 - This milestone will require the team to build the base application for both apps. This will allow the team to split off on working with both apps to build their respective requirements and put together the communication systems. The completion of the base app will also show what the team can do with Android Studios and Java libraries so that we can plan out the final requirements.
- Milestone 3: Build and develop the communication systems between the teacher and student apps - Complete by 4/22
 - This milestone basically serves as the pre-final draft due date. It will give the team some time to iron out any bugs or problems encountered from the overall project and the interactions between the two main apps. The base project should be completed by this time, giving the team ample time to finalize every aspect of the project before the final turn-in.

Project Schedule

This is a basic list of due dates and completion windows for each major aspect of the project such as deliverables, status reports, milestones, and application progression. This project schedule is also tentative as requirements and development strategies may change throughout the semester due to any problems that are encountered or a change requested by the client.

February

- **Status Report 1 - Due Thursday 2/11**
- **Project Plan Deliverable - Due Friday 2/12**
- Finish learning Android Studios and Android Database SQL by Monday
- Meet with Client to discuss requirements - Complete by 2/15
- Build Database code - Complete by 2/25
- **Status Report 2 - Due 2/25**
- Finish draft for "Requirements Specifications Deliverable" - Due 2/27
- Milestone 1: Implement log-in functionality - Complete by 2/29
- **Requirements Specifications Deliverable - due 2/29**

March

- Finish draft for "Design Document Deliverable" - Due 3/9
- Build the main screens and toolbar - Complete by 3/10
- **Status Report 3 - Due 3/10**
- **Design Document Deliverable - Due 3/11**
- Meet with client for midterm results and progress - Complete by 3/18
- Implement access to all education tools for the student app - Complete by 3/24
- Implement the function to switch between main screens and their features - Complete by 3/24
- **Status Report 4 - Due 3/24**
- Milestone 2: Finish building the basic student application and copy over to the teacher application - Complete by 3/31
- **Midterm Requirements and Design Review - Due 3/31**

April

- **Status Report 5 - Due 4/7**
- Implement specific teacher application requirements - Complete by 4/12
- Implement specific student application requirements - Complete by 4/12
- Finish draft for "Users/Administrators Manual Deliverable" - Due 4/13
- **Users/Administrators Manual Deliverable - Due 4/15**
- Plan and Practice "Design Day" presentations - Due 4/19
- Milestone 3: Build and develop the communication systems between the teacher and student apps - Complete by 4/22
- Meet with client for results and progress - Complete by 4/22
- **Design Day Presentations - 4/25**
- Finish draft for "Delivery Plan Deliverable" - Due 4/27
- **Delivery Plan Deliverable - Due 4/29**

May

- **Client, Instructor, and Peer Reviews - Due 5/2**
- Final draft of the project - Due 5/5
- **Status Report 6 - Due 5/5**

Team Meetings have also been scheduled to be weekly throughout the semester. These meetings are also subject to change due to any outside interference and such. All team meetings will be conducted at Discovery Park.

- Tuesdays after CSCE 4901 class
- Fridays at 2:00 PM

Monitoring

Upon developing this project we will use GitHub as our code sharing source. The monitoring structure works as follows:

- A team member will set up an account and add everyone so they have access to the project.
- In GitHub, everyone will get their own branch so they can work on their part of the project.
- The branches will have project requirements and deadlines so team members have to complete their part within the specified date.
- Once a team member have completed their part of the project, they are to upload their branch to the master branch so that every can see their completed work.
- Upon uploading their part of the project, they are to type a statement saying what they did, how they did it, and what they will do next.

We believe this is an effective way of monitoring since we can monitor every one of our team members and also help them if needed.