CMSC 447

Software Development Plan (SDP)

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# Scope

This section shall be divided into the following paragraphs.

## Identification

This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

## System overview

This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

The goal of this project is to create a web application which will allow a user to create an account, and from such account be able to evaluate different statistical values such that a list of locations within the United States will be outputted to the user which correlate to the user input. With the list, a map should be presented with pins that correlate to the location and can then be further expanded to output a location image or description.

We expect to use a database for maintaining username and password data. Along with this we expect to be using third party software for our output. This would include the use of GoogleMaps for our map output, and possibly Flickr for our image outputs, and Wikipedia for a description output. Further third-party software will be expanded in this section as seems fit throughout the project.

Because the nature of this project is in the scope of a classroom project, there will not be long term maintenance of the project and will be run on a local machine. Throughout this document the term sponsor will refer to John Winder who is the group’s client throughout the project. Similarly, the group refers to the group of developers working on the project including Matthew Hearn, Aaron Lewis, Alex Rochford, Cathy Poore, Ben Kittner, and Steven Heckman. The project will refer to the software and documentation created for this assignment.

All project development will be done through GitHub and then developer preference for development environments, debuggers, ect. The web portion of the application will be implemented through UMBC’s student web environment(SWE.) Due to this, as per UMBC’s DoIT guidelines, all user data inputted into a webpage is stored in an insecure manner which will be further noted within the web application. The reference for further information on the SWE is found on <https://wiki.umbc.edu/pages/viewpage.action?pageId=67994741>.

## Document overview

This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

The goal of this document is to give a brief overview of the project, as well as explain the development process of the project group. This will include coding practices including but not limited to file headers, function headers, indentation practices, file names, function names, variable names, development environments, used programming languages. Further explained practices will include design and testing processes.

These practices and to be viewed as fluid and as different concerns are raised between the development group or project client this document may be modified as necessary. For this reason, after approval has been given from the client any modifications to the document will be resubmitted for approval and require permission. In a similar manner, if the client wishes for any modifications these should be expressed either through email or verbally which are then approved upon in the form of meeting minutes from the group. With the goal of transparency in mind any modifications to this document will be explicitly noted and noted in the section below.

1.3a Version Modifications

Ver1.0: Original Document

This includes the paragraph description for each heading which will then be deleted upon approval. Additionally, any empty section is kept for both client and group approval.

## Relationship to other plans

This paragraph shall describe the relationship, if any, of the SDP to other project management plans.

# Referenced documents

This section shall list the number, title, revision, and date of all documents referenced in this plan. This section shall also identify the source for all documents not available through normal Government stocking activities.

The following are referenced documents throughout this document and include the common acronym for referencing the document:

SRS- Software Requirements Specification

SUM- Software User Manual

# Overview of required work

This section shall be divided into paragraphs as needed to establish the context for the planning described in later sections. It shall include, as applicable, an overview of:

1. Requirements and constraints on the system and software to be developed

-Currently there are no system constraints and all software requirements can be found in the SRS

1. Requirements and constraints on project documentation

-Currently no documentation constraints

1. Position of the project in the system life cycle

As of version 1.0 we are just beginning the development life cycle. We are looking into different means of implementation of data visualization, as well as researching data for the project. We have also begun implementing the user account creation and login portion of the project. In terms of documentation we have completed the formation of project requirements and will begin the creation of the project design. This section is intended to be completed further as the project continues.

1. The selected program/acquisition strategy or any requirements or constraints on it

-Currently there are no program/acquisition constraints.

1. Requirements and constraints on project schedules and resources

The only defined guideline for dates is the final project presentation which is to be done May 10th. Recommended guidelines for documentation dates were given by Professor Cain.

1. Other requirements and constraints, such as on project security, privacy, methods, standards, interdependencies in hardware and software development, etc.

-Currently there are no other project constraints.

# Plans for performing general software development activities

This section shall be divided into the following paragraphs. Provisions corresponding to non-required activities may be satisfied by the words "Not applicable." If different builds or different software on the project require different planning, these differences shall be noted in the paragraphs. In addition to the content specified below, each paragraph shall identify applicable risks/uncertainties and plans for dealing with them.

## Software development process

This paragraph shall describe the software development process to be used. The planning shall cover all contractual clauses concerning this topic, identifying planned builds, if applicable, their objectives, and the software development activities to be performed in each build.

This project is to be viewed as using a mixture between waterfall and agile development processes. The waterfall portion of the project will best correspond to the documentation portions which are to be completed in a systematic order. However, each document is to be viewed as fluid and modified when necessary. Upon modification after client approval, the client will be notified. All documents will receive a final signature upon completion of the project.

The software coding portions of the project are to be viewed with an agile development process such that code should be developed in a manner that is flexible and compartmentalized allowing each software the development flexibility of coding the portions where they are most experienced. Because of the software development flexibility, the documentation portions of the project will need to be updated as new tools or methods are included in the software.

## General plans for software development

This paragraph shall be divided into the following subparagraphs.

### Software development methods

This paragraph shall describe or reference the software development methods to be used. Included shall be descriptions of the manual and automated tools and procedures to be used in support of these methods. The methods shall cover all contractual clauses concerning this topic. Reference may be made to other paragraphs in this plan if the methods are better described in context with the activities to which they will be applied.

There is great flexibility in the software development methods to be used by the group. As such, this portion will be expanded as new software tools and methods are used. Currently, we expect to be using a SQL database for holding user login data, and python for the back-end data analytics and file management.

All code and documentation are to be committed and pushed to the GitHub master repository. With the continued goal of transparency any scripts and similar assisting projects are also be included within the GitHub repository for the use of other group members, as well as for viewing by the client.

### Standards for software products

This paragraph shall describe or reference the standards to be followed for representing requirements, design, code, test cases, test procedures, and test results. The standards shall cover all contractual clauses concerning this topic. Reference may be made to other paragraphs in this plan if the standards are better described in context with the activities to which they will be applied. Standards for code shall be provided for each programming language to be used. They shall include at a minimum:

* + - 1. Standards for format (such as indentation, spacing, capitalization, and order of information)

This section deals with the standard of code formatting. It is to be noted that the goal of readability is to be of greater importance than holding to these standards. If there is deviation from the standards a note within the comments should be given with explanation if necessary. In general, all indentation should be done with by using standard 8-character tabs.

In general, single line spacing is to be used for smaller sections of code. If a code portion is more than 5 lines, then there should be a line separating the beginning and end of the segment. A segment is defining as apportion of code that manipulates the same data. This would be typically occurring during a function definition and loop structures. Again, developer judgement should be used for evaluating if deviating from the defined standard would create more readable code.

* + - 1. Standards for header comments (requiring, for example, name/identifier of the code; version identification; modification history; purpose; requirements and design decisions implemented; notes on the processing (such as algorithms used, assumptions, constraints, limitations, and side effects); and notes on the data (inputs, outputs, variables, data structures, etc.)

Header comments should be included at the beginning of any software file, as well as prior to any new function or method. File headers should include the name of the file, the original creator of the file, the date the file was last modified, as well as a brief description of the functionality within the file.

Function headers should include the name of the function creator (if different than the file creator), requirements that the function intends to be satisfying, test associated with the function, inputs to the function, expected outputs of the function, any error handling being done by the function, and a brief description of the function if not satisfied by the inputs and outputs.

Furthermore, if code is being submitted to GitHub with known bugs, the bugs should be described as the ending of the file or function header. Each header must also include a section for another team member to initial which will serve to represent a code review.

* + - 1. Standards for other comments (such as required number and content expectations)

Because all code is to include file and function headers of the name of the code creator, when modifying another group members code, a comment should be included either on the line of the modification, or for larger segments of code at the beginning and ending of the code segments with the modifiers initials. Each segment of code is expected to have a comment explaining what is occurring within the code segment. Furthermore, if a portion of code is more complex a comment should be included. This would include a URL for referenced website, or an explanation for what is being done.

* + - 1. Naming conventions for variables, parameters, packages, procedures, files, etc.

All naming for files, function, and variables should follow the following standards. A filename should be in the format of “NameOfDocument.ext” such that each word begins with a capitalized letter, including the first. Filenames should allow a not working individual to assume the role of that file from the filename. A function name should take a format of “functionName” such that the first letter is always lowercase, and all other words of the statement begin with a capital letter. Like other names, the function name should demonstrate the purpose of the function. A function name that cannot follow this should most likely be broken into multiple functions for readability. Finally, variable names should be the format of “variable\_name” such that everything is lowercase, and words are separated through the user of an underscore. Variable names should be relevant to the scope of the function they are being implemented within and should thus be different than the name of a global or larger scope variable being passed into a function. For example, if an array is being passed into a modification function, then the global name “array” should not be used within the function, and instead use a name such as “arr” within the function scope. This intends to avoid naming errors, as well as maintain readability and obvious function scope differences within functions. Like the other portions, if a different naming scheme allows for better readability a note within the comments should be provided.

* + - 1. Restrictions, if any, on the use of programming language constructs or features

-Currently there are no constraints on programming language. As different languages are used this section will be developed.

* + - 1. Restrictions, if any, on the complexity of code aggregates
* Currently there are no restrictions on code aggregates.

### Reusable software products

This paragraph shall be divided into the following subparagraphs.

#### Incorporating reusable software products

This paragraph shall describe the approach to be followed for identifying, evaluating, and incorporating reusable software products, including the scope of the search for such products and the criteria to be used for their evaluation. It shall cover all contractual clauses concerning this topic. Candidate or selected reusable software products known at the time this plan is prepared or updated shall be identified and described, together with benefits, drawbacks, and restrictions, as applicable, associated with their use.

#### Developing reusable software products

This paragraph shall describe the approach to be followed for identifying, evaluating, and reporting opportunities for developing reusable software products. It shall cover all contractual clauses concerning this topic.

Currently there are requirements for creating reusable software products. However, as a best practice all code should be written in an easily reusable manner. This would be most applicable to practices of file, function, and variable naming. Similarly, functionality should be expanded such that each function only accomplishes a single task, such that each function could be individually reused. Finally, it is expected that functions to not manipulate an original data set, and instead work on a copy of the data set such that if a process were to be reused there would not be unintentional data manipulation. When this practice cannot be met, for example with file I/O, a note should be made within the comments simply stating that there is access to the original data set.

### Handling of critical requirements

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for handling requirements designated critical. The planning in each subparagraph shall cover all contractual clauses concerning the identified topic.

#### Safety assurance

There are currently no safety requirements associated with this project.

#### Security assurance

There are currently no security requirements associated with this project.

#### Privacy assurance

There are currently no privacy requirements associated with this project.

#### Assurance of other critical requirements

There are no other critical assurance requirements. For a list of other requirements see the SRS.

### Computer hardware resource utilization

This paragraph shall describe the approach to be followed for allocating computer hardware resources and monitoring their utilization. It shall cover all contractual clauses concerning this topic.

There are currently no hardware resources that would need to be monitored for the use of the project.

### Recording rationale

This paragraph shall describe the approach to be followed for recording rationale that will be useful to the support agency for key decisions made on the project. It shall interpret the term "key decisions" for the project and state where the rationale is to be recorded. It shall cover all contractual clauses concerning this topic.

There are currently no explicit measures in place for recording rationale. It is expected that as occurrences occur they be documented with email correspondence, and when verbally expressed during a meeting, meeting minutes should be sent out within 48 hours of the meeting and reviewed by all group member and the client within the next 48 hours. If this cannot be done a simple response noting that the minutes were received with an expected timeframe of when the minutes will be read should be stated. This should be sent within the group within the scope of the group members.

### Access for acquirer review

This paragraph shall describe the approach to be followed for providing the acquirer or its authorized representative access to developer and subcontractor facilities for review of software products and activities. It shall cover all contractual clauses concerning this topic.

The client should be granted read-only access to the group’s GitHub repository with the goal of being able to review any code. Any notes on the code should be sent to the group in the form of an email message or be verbally expressed in the next group meeting which should then follow the normal meeting minute procedure.

# Plans for performing detailed software development activities

This section shall be divided into the following paragraphs. Provisions corresponding to non-required activities may be satisfied by the words "Not applicable." If different builds or different software on the project require different planning, these differences shall be noted in the paragraphs. The discussion of each activity shall include the approach (methods/procedures/tools) to be applied to: 1) the analysis or other technical tasks involved, 2) the recording of results, and 3) the preparation of associated deliverables, if applicable. The discussion shall also identify applicable risks/uncertainties and plans for dealing with them. Reference may be made to [4.2.1](#_bookmark0) if applicable methods are described there.

## Project planning and oversight

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for project planning and oversight. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Software development planning (covering updates to this plan)

### CSCI test planning

### System test planning

### Software installation planning

### Software transition planning

### Following and updating plans, including the intervals for management review

Currently the only testing procedures in place will be that the code segments are expected to be unit tested, and then integration tested. As further developments are made this portion will be expanded.

## Establishing a software development environment

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for establishing, controlling, and maintaining a software development environment. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Software engineering environment

### Software test environment

### Software development library

### Software development files

### Non-deliverable software

Currently there are no requirements focused on the development environments and usable libraries. As different environments or libraries are used this section will be expanded.

## System requirements analysis

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system requirements analysis. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Analysis of user input

User input should be mostly evaluated within the user login portion of the code. This should validate that proper usernames and passwords are being used. This is further expanded in the SRS.

### Operational concept

Currently there are no requirements associated with the operational concept outside that the project is a web application.

### System requirements

Further requirements can be found in the SRS.

## System design

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system design. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### System-wide design decisions

As system-wide design decisions are made this section will be expanded.

### System architectural design

As system architectural design decisions are made this section will be expanded.

## Software requirements analysis

This paragraph shall describe the approach to be followed for software requirements analysis. The approach shall cover all contractual clauses concerning this topic.

## Software design

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software design. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### CSCI-wide design decisions

As CSCI-wide design decisions are made this section will be expanded.

### CSCI architectural design

As CSCI architectural design decisions are made this section will be expanded.

### CSCI detailed design

This section will be expanded as CSCI components begin to be implemented.

## Software implementation and unit testing

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software implementation and unit testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Software implementation

All software in intended to be developed in a manner that will allow for unit testing, and as such each function should be limited, and complete a single testable task.

### Preparing for unit testing

Following the above procedure, functions should be easily testable. Similarly, each developer is expected to create their own unit test as they develop code segments.

### Performing unit testing

Upon completion of each code segment it is expected that the portion of code is to be unit tested.

### Revision and retesting

When a code segment is modified, unit testing shall be performed again. Similarly, if there is failed integration testing, a unit test for the failure should be developed.

### Analyzing and recording unit test results

All unit testing should present some time of visualization for the developer demonstrating that the code portion has “passed” the unit test. As the code segment becomes for well developed then a single output can be used for the accumulation of unit test for an extended portion of code.

## Unit integration and testing

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for unit integration and testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Preparing for unit integration and testing

All code should be developed within the context of what they will be integrated into, and though of as portion of the entire system. Integration testing serves as to test the macrocode portions. Ignoration testing should be done if all unit test for the code segment are passed. Furthermore, it is expected that all code units will then be a part of the CSCI and should be developed within the CSCI context.

### Performing unit integration and testing

Integration testing should begin once all the components of a code segment pass the individual unit test. The integration test should test all possible “routes” of the code and would be most associated with the loop structures of the code.

### Revision and retesting

Integration testing should check that previous unit test are not being failed, as well as test the overall system. Failed unit test should be documented and with the developer of the failed portion.

### Analyzing and recording unit integration and test results

## CSCI qualification testing

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for CSCI qualification testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Independence in CSCI qualification testing

CSCI testing is intended to be primarily done by the client in a manner that states overall success or failure of the system. Successful CSCI would be able to be publicly released and used in a manner that would demonstrate new usability within the web application.

### Testing on the target computer system

Since the application will be locally run, all test will be done in a local web environment.

### Preparing for CSCI qualification testing

CSCI qualification testing should begin to be approached in integration testing and should be the overall goal of the software component. Successful test should test all possible code paths, as well as handle user input errors.

### Dry run of CSCI qualification testing

All CSCI qualification testing is expected to be done by the software development group prior to testing with the client. These test results should be known prior to product demonstrations with the intention of limiting portions of the code that are not currently implemented.

### Performing CSCI qualification testing

CSCI qualification testing should be done upon completion of an individual CSCI. Upon a successful dry-run a meeting should be planned with the client to demonstrate the functionality which should then receive approval or disapproval. Completion of a CSCI allows for the next development cycle for creating new functionality within the application.

### Revision and retesting

Upon the development of a new CSCI component, the previous test should be checked to ensure that previous test to not fail. This would similarly be tested within the dry-run as well as client demonstrations.

### Analyzing and recording CSCI qualification test results

Each CSCI should be associated with at least one requirement on the SRS and will be recorded in the ending table of the SRS document.

## CSCI/HWCI integration and testing

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in CSCI/HWCI integration and testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Preparing for CSCI/HWCI integration and testing

### Performing CSCI/HWCI integration and testing

### Revision and retesting

### Analyzing and recording CSCI/HWCI integration and test results

-no hardware implementation components

## System qualification testing

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for participating in system qualification testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Independence in system qualification testing

Upon completion of each CSCI component, previous testing should be done to ensure the overall system is not being modified. This should be tested on the individual CSCI test level.

### Testing on the target computer system

This will be run on a local environment.

### Preparing for system qualification testing

The system test should be formatted such that each test meets a specific requirement listen within the SRS. A successful system qualification test would represent a successful project.

### Dry run of system qualification testing

All system tests are expected to be run by the group prior to a client meeting with documentation on what requirements are currently being met and which requirements currently need to be met.

### Performing system qualification testing

System qualification test are expected to be done with the client present, and upon successful test signature on the final signatures should be completed on the SRS documentation.

### Revision and retesting

If a portion of the system is modified after system testing, then the SRS document should be modified with the new testing date as well as a description of what modifications are being made to the system.

### Analyzing and recording system qualification test results

All system test should be recorded within the SRS table.

## Preparing for software use

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for preparing for software use. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Preparing the executable software

All software will be locally run and therefore executable software will be locally owned and executed. There should be no need to prepare executable software outside of the CSCI and system testing.

### Preparing version descriptions for user sites

All version descriptions will be noted within this documentation.

### Preparing user manuals

The user manual will be maintained in the SUM

### Installation at user sites

There should be no need to install at a user site since the project will be run locally.

## Preparing for software transition

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for preparing for software transition. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Preparing the executable software

### Preparing source files

### Preparing version descriptions for the support site

### Preparing the "as built" CSCI design and other software support information

### Updating the system design description

### Preparing support manuals

### Transition to the designated support site

No further testing outside of the CSCI and system testing since the project will be locally run.

## Software configuration management

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software configuration management. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Configuration identification

### Configuration control

### Configuration status accounting

### Configuration audits

### Packaging, storage, handling, and delivery

Each version should be associated with completion of a CSCI element. Due to the scope of the project configuration control should not be needed.

## Software product evaluation

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for software product evaluation. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### In-process and final software product evaluations

In-process product evaluation should be done upon completion of each CSCI component and receive a signature within the SRS upon successful demonstration. The final software product is to be completed on 5/10 within the classroom environment. All test should be done against the requirements laid out in the SRS.

### Software product evaluation records, including items to be recorded

Product evaluation should be completed with CSCI and system testing, and any modification or bugs should be reported and documented within the context of each test.

### Independence in software product evaluation

The software product is to be evaluated for approval by the client to avoid development group influence,

## Software quality assurance

This paragraph shall be divided into the following sub- paragraphs to describe the approach to be followed for software quality assurance. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Software quality assurance evaluations

Software quality assurance should be evaluated with each CSCI and system demonstration.

### Software quality assurance records, including items to be recorded

To maintain software quality the group intends to use practices of code review as well as the use of unit, integration, CSCI, and system testing.

### Independence in software quality assurance

Quality assurance will be independent using code review, and then final approval from the client.

## Corrective action

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for corrective action. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Problem/change reports, including items to be recorded (candidate items include project name, originator, problem number, problem name, software element or document affected, origination date, category and priority, description, analyst assigned to the problem, date assigned, date completed, analysis time, recom- mended solution, impacts, problem status, approval of solution, follow-up actions, corrector, correction date, version where corrected, correction time, description of solution implemented)

All product bug reports are intended to be documented within JIRA (assuming this is setup by the University.) If this is not done, then a single document will be created and kept in the GitHub repository for bug reporting.

### Corrective action system

-There is no corrective action system for this project.

## Joint technical and management reviews

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for joint technical and management reviews. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Joint technical reviews, including a proposed set of reviews

### Joint management reviews, including a proposed set of reviews

The scope of technical reviews will be simple initials from code reviews. Each unit should be independently reviewed by another group member which will be kept in the header section of individual units. There will be no management reviews for this project since there is no management.

## Other software development activities

This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for other software development activities. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

### Risk management, including known risks and corresponding strategies

### Software management indicators, including indicators to be used

### Security and privacy

### Subcontractor management

### Interface with software independent verification and validation (IV&V) agents

### Coordination with associate developers

### Improvement of project processes

### Other activities not covered elsewhere in the plan

As difference risk are presented within the project this section will be further developed.

# Schedules and activity network

This section shall present:

1. Schedule(s) identifying the activities in each build and showing initiation of each activity, availability of draft and final deliverables and other milestones, and completion of each activity
2. An activity network, depicting sequential relationships and dependencies among activities and identifying those activities that impose the greatest time restrictions on the project

This section will be further expanded once builds are completed. This may further be represented on JIRA if setup.

# Project organization and resources

This section shall be divided into the following paragraphs to describe the project organization and resources to be applied in each build.

## Project organization

This paragraph shall describe the organizational structure to be used on the project, including the organizations involved, their relationships to one another, and the authority and responsibility of each organization for carrying out required activities.

## Project resources

This paragraph shall describe the resources to be applied to the project. It shall include, as applicable:

1. Personnel resources, including:
   1. The estimated staff-loading for the project (number of personnel over time)

Our group has 6 members.

* 1. The breakdown of the staff-loading numbers by responsibility (for example, manage-ment, software engineering, software testing, software configuration management, software product evaluation, software quality assurance)

Each member is expected to participate in the documentation, software development, unit testing, integration testing, system testing, and code review processes.

* 1. A breakdown of the skill levels, geographic locations, and security clearances of personnel performing each responsibility

We are all college students at UMBC with no need for security clearances for this project. Each member is expected to perform all portions of the project. For transparency, each document will include the name of the developer for that code segment.

1. Overview of developer facilities to be used, including geographic locations in which the work will be performed, facilities to be used, and secure areas and other features of the facilities as applicable to the contracted effort.

Development is expected to be done by the group where they please which could include but is not limited to the UMBC campus, personal living spaces, or any public location.

1. Acquirer-furnished equipment, software, services, documentation, data, and facilities required for the contracted effort. A schedule detailing when these items will be needed shall also be included.

None.

1. Other required resources, including a plan for obtaining the resources, dates needed, and availability of each resource item.

None.

# Notes

This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

# Appendixes

Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DESCRIPTION/PURPOSE

The Software Development Plan (SDP) describes a developer’s plans for conducting a software development effort. The term "software development" is meant to include new development, modification, reuse, reengineering, maintenance, and all other activities resulting in software products.

The SDP provides the acquirer insight into, and a tool for monitoring, the processes to be followed for software development, the methods to be used, the approach to be followed for each activity, and project schedules, organization, and resources.

APPLICATION/INTERRELATIONSHIP

Portions of this plan may be bound separately if this approach enhances their usability. Examples include plans for software configuration management and software quality assurance.

The Contract Data Requirements List (CDRL) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

PREPARATION INSTRUCTIONS

General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required can be made more readable using these styles.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this document, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this document has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents, including other project plans, may be substituted for all or part of the document if they contain the required data.